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CEMENT and ENGINEERING NEWS (Est. 1896)

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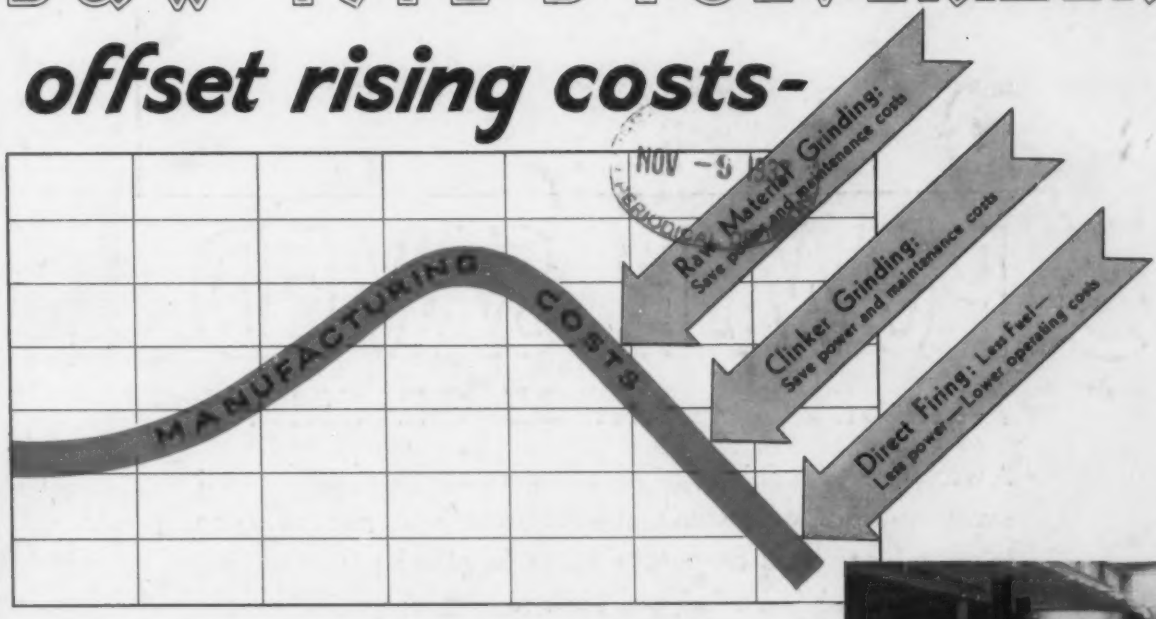

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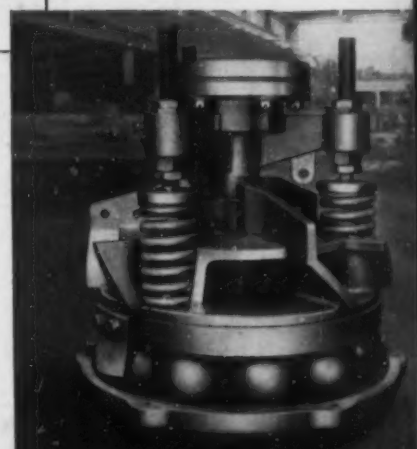

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BELOW: General view of J. E. Montgomery Sand & Gravel Plant. Employs Link-Belt Anti-Friction Belt Conveyors and 15′ dia. Dewatering Rotoscoop (upper illustration) for reclaiming and dewatering the sand grains in the overflow water. Foreground shows 25,000 cu. yd. pile of sand recovered by the Rotoscoop.

LINK-BELT

Equipment for Handling Sand, Gravel, Stone

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Rock Products

Which is consolidated with the journals

CEMENT and ENGINEERING NEWS CONCRETE PRODUCTS

Founded 1896 Est. 1918

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RECOGNIZED THE WORLD OVER AS THE LEADER IN ITS FIELD

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RESTLESS ROADS

Story of another Goodrich development in rubber

ALL pavement is in constant motion, expanding with heat, contracting with cold. One mile of concrete, for example, is two to three feet longer in summer than in winter. Where does that three feet go? Without some provision, the pavement would buckle and destroy itself, so concrete roads are laid in sections of 60 or 90 feet, with space between to allow for expansion, and the space filled with asphalt.

But, when the pavement expands, some of this asphalt is forced out, and you have annoying bumps. So highway departments send out crews to trim off the overflowed material. In the fall, as the pavement contracts with cold and the spaces widen, they have to be filled again, or else dirt and ice would get in between the road sections and eventually cause them to buckle. Materials which do not flow have been tried, but these would not fill the joints when the pavement contracted.

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Goodrich

ALL *products problems* IN RUBBER

Another story of Goodrich development work appears on page 128

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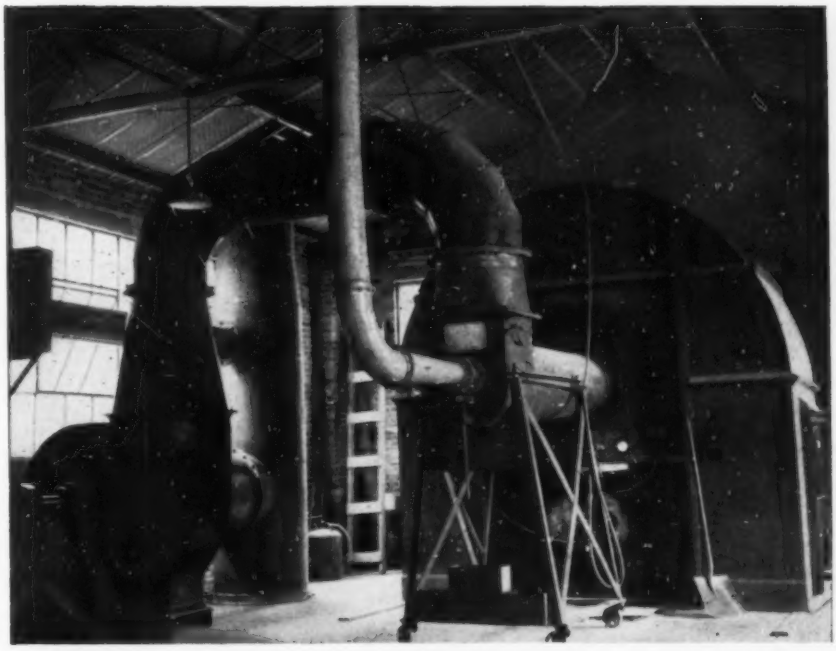

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Side view of Model 99 S Hug Roadbuilder showing body in raised position.

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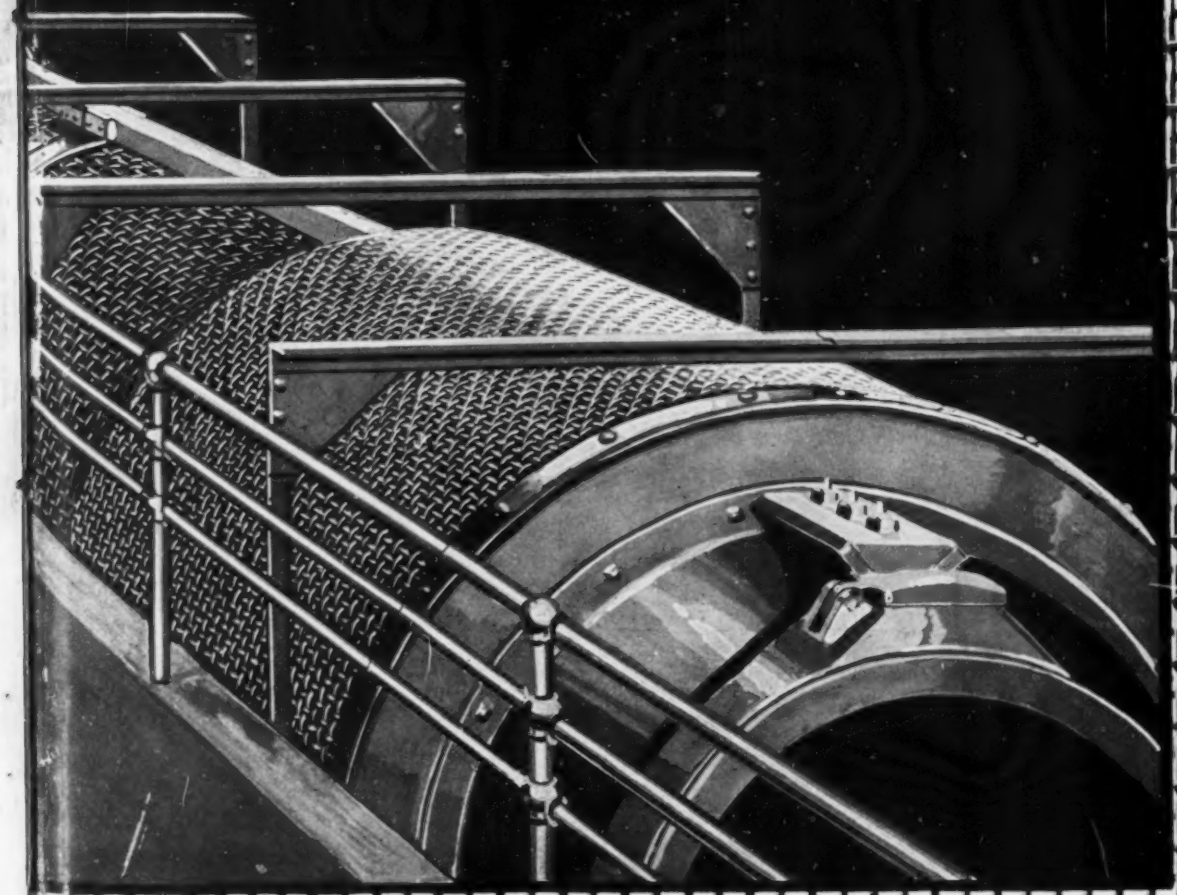

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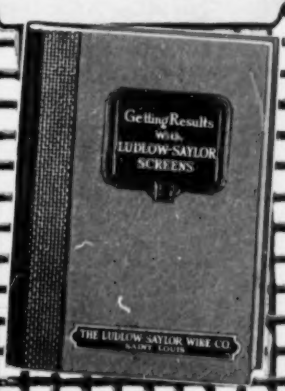

The LUDLOW-SAYLOR WIRE COMPANY ST. LOUIS

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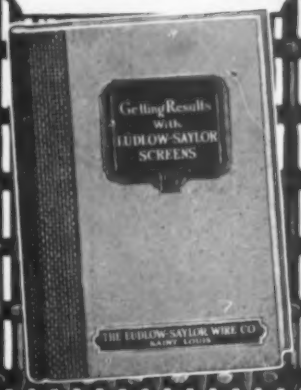

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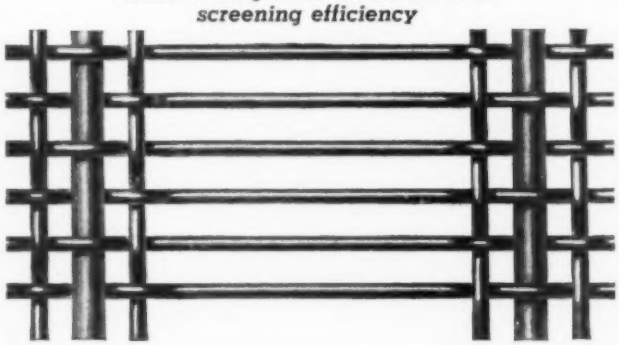
combine long wear with maximum screening efficiency



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Samples will be furnished upon request

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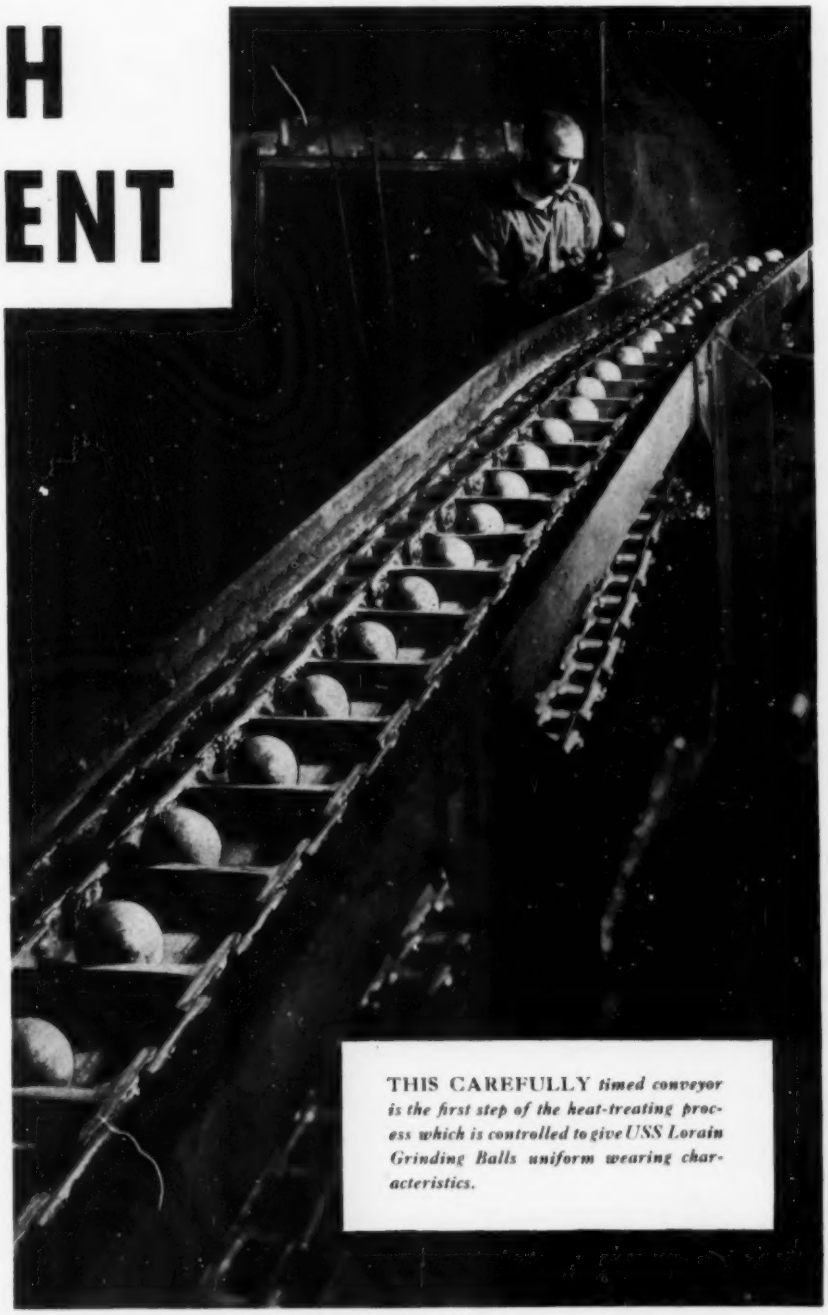
ROUGH TREATMENT



THIS CAREFULLY *timed conveyor is the first step of the heat-treating process which is controlled to give USS Lorain Grinding Balls uniform wearing characteristics.*

HOW much pounding can a grinding ball take? Measured in terms of service, the answer is found in the quality of the steel from which they are made, the method of manufacture and adherence to specifications determined by the service to which the balls will be subjected.

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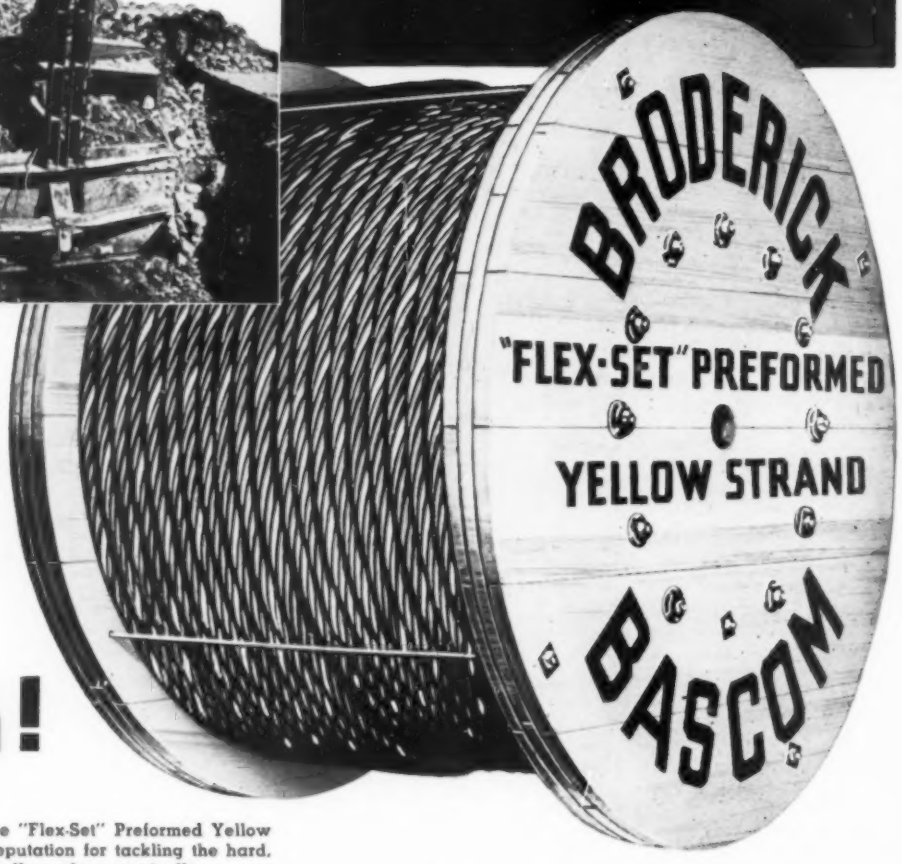
UNITED STATES STEEL

"Flex-Set" Preformed YELLOW STRAND



It's Tough!

Yes, tough is the word—because "Flex-Set" Preformed Yellow Strand has a well established reputation for tackling the hard, grilling jobs, and doing them well—and economically.

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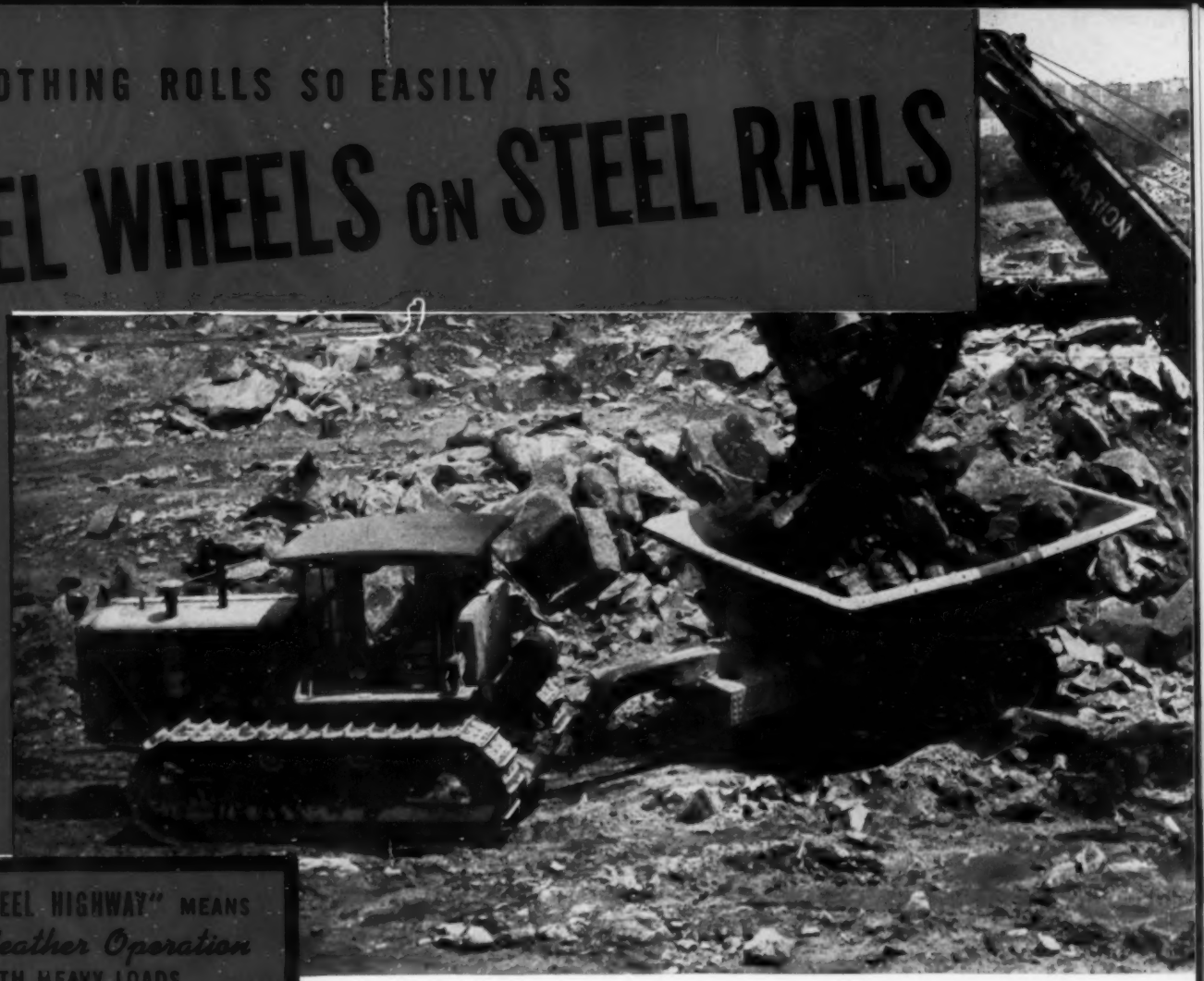
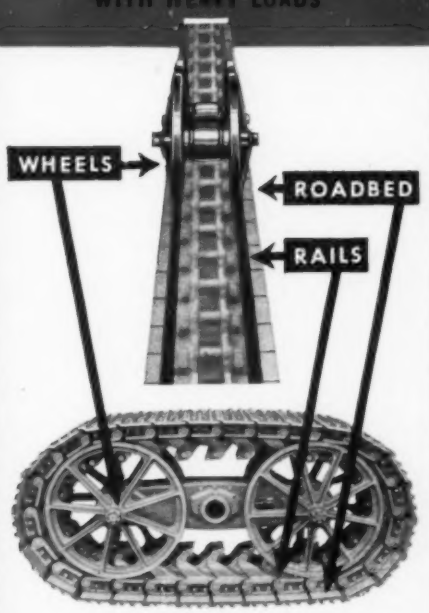
NOTHING ROLLS SO EASILY AS

STEEL WHEELS ON STEEL RAILS



THE "STEEL HIGHWAY" MEANS
All-Weather Operation
WITH HEAVY LOADS



THAT'S WHY YOU NEED THIS "STEEL HIGHWAY" FOR YOUR HEAVY LOADS

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ATHEY Forged-Trak
(REG. TRADE-MARK)

SIDE-DUMP QUARRY TRAILERS

• By loading out 700 to 800 tons of shot rock daily, this Lorain shovel equipped with new type boom keeps the crusher hustling at the quarry of the Valley Dolomite Company, Bonne Terre, Mo.

DISHIN' UP ROCK for Hungry Crushers

It's the crusher that turns rock into ready cash. Profits depend upon your supplying it with all the material it can efficiently handle. That's why it's important that you select a shovel capable of maintaining a daily production which measures up to crusher capacity.

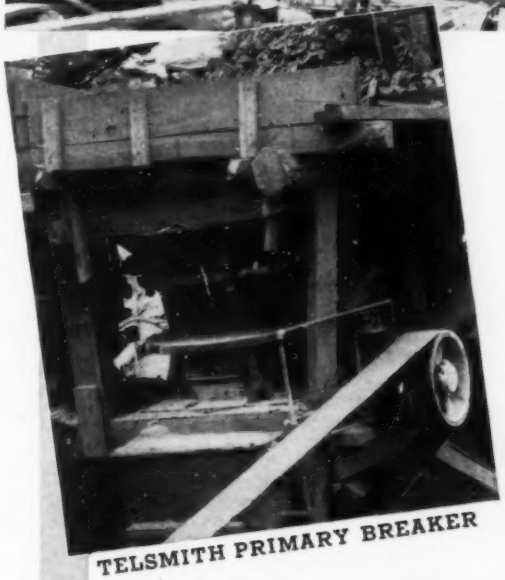
And here's the shovel that can dish it up. It's the 1½-yd. Lorain-77 with a boom that is made to order for quarry service. For the first time in history, quarries are offered a shovel boom which is designed accurately for torsion as well as bending and compressing stresses. Equipped with this rugged "front end," the Lorain-77 can be depended upon to deliver the goods day in and day out in the toughest rock digging.

Write today for complete information on the 1½-yd. Lorain-77 and this new boom development. Once you get the facts you will readily recognize this shovel's ability to take it as well as dish it up.

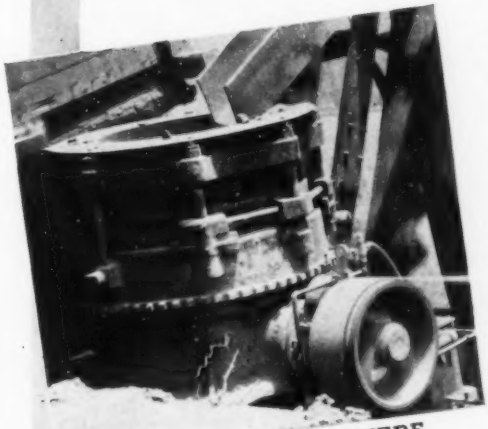
THE THEW SHOVEL COMPANY • LORAIN, OHIO

THEW CENTER DRIVE

1½ yd. LORAIN "77"



TELSMITH PRIMARY BREAKER



TELSMITH GYRASPHERE

CRUSHED STONE *for Roads*

AT THE LOWEST COST PER TON

A well-known Southeastern contractor, E. W. Grannis of Fayetteville, N. C., had his troubles in crushing hard abrasive rock for road grading and surfacing jobs. Jaw crushers proved unsatisfactory for both coarse and secondary crushing—also very expensive to maintain. Rolls also proved inadequate. Along with other big operators, Grannis has solved his crushing problems by discarding jaw crushers for Telsmith gyratory breakers. For secondary crushing, roll crushers were applied with Telsmith Gyraspheres—with distinctly better results.

Mr. Grannis had a 6½ mile road job at Mocksville, near Statesville, N. C. And it meant 50,000 tons of minus 1½ in.—crushing granite boulders and field stone. So he bought this complete Telsmith rock crushing plant—(A) No. 13B Telsmith Gyratory Crusher; (B) 32 ft. No. 6 Telsmith Belt Elevator; (C) 4 ft. x 10 ft. Telsmith double deck Pulsator Screen; (D) 16 in. x 22 ft. Telsmith Reject Conveyor; (E) No. 36 Telsmith Gyrasphere Crusher. The screen is mounted over a 25 cu. yd. bin. A 100 hp. Diesel powers the equipment.

This Telsmith plant has convincingly demonstrated its ability to produce stone for road grading and surfacing at the lowest possible cost per ton. And it has set a remarkable record for low maintenance. Whether you are planning a new plant or modernizing, *write for Bulletin E-11* describing Telsmith quarry and gravel pit equipment. G-3

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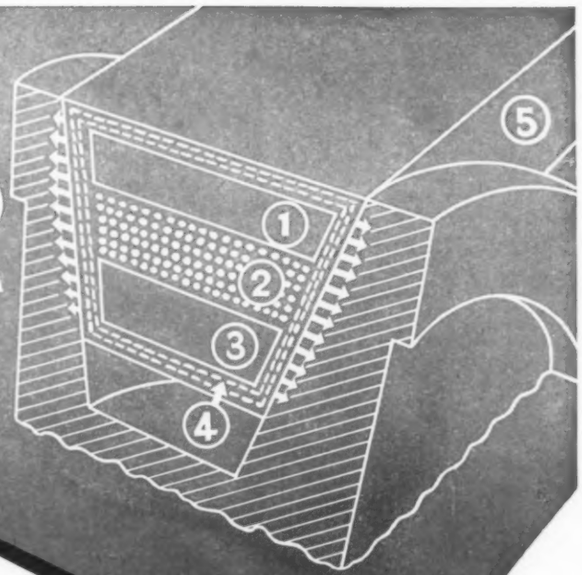

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***Gilmer grip* makes Gilmer "V's" do faster, cheaper work. Cuts out waste. Cuts down costs. Steps up the delivered power you get (the power you're paying for!). Get Gilmers on the job right now... FREE Gilmer Catalogue filled with facts.**

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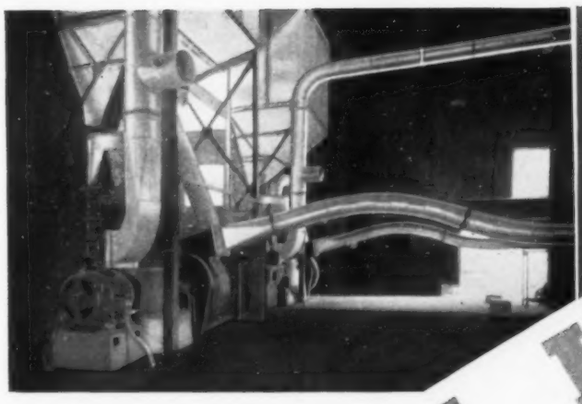
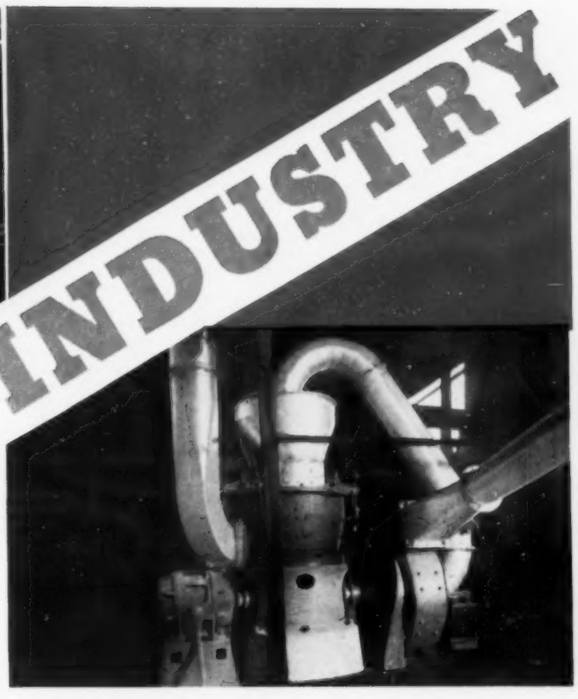


Raymond Bowl Mill installations operating in nationally known cement plants for direct firing rotary kilns.



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WHIZZER SEPARATORS

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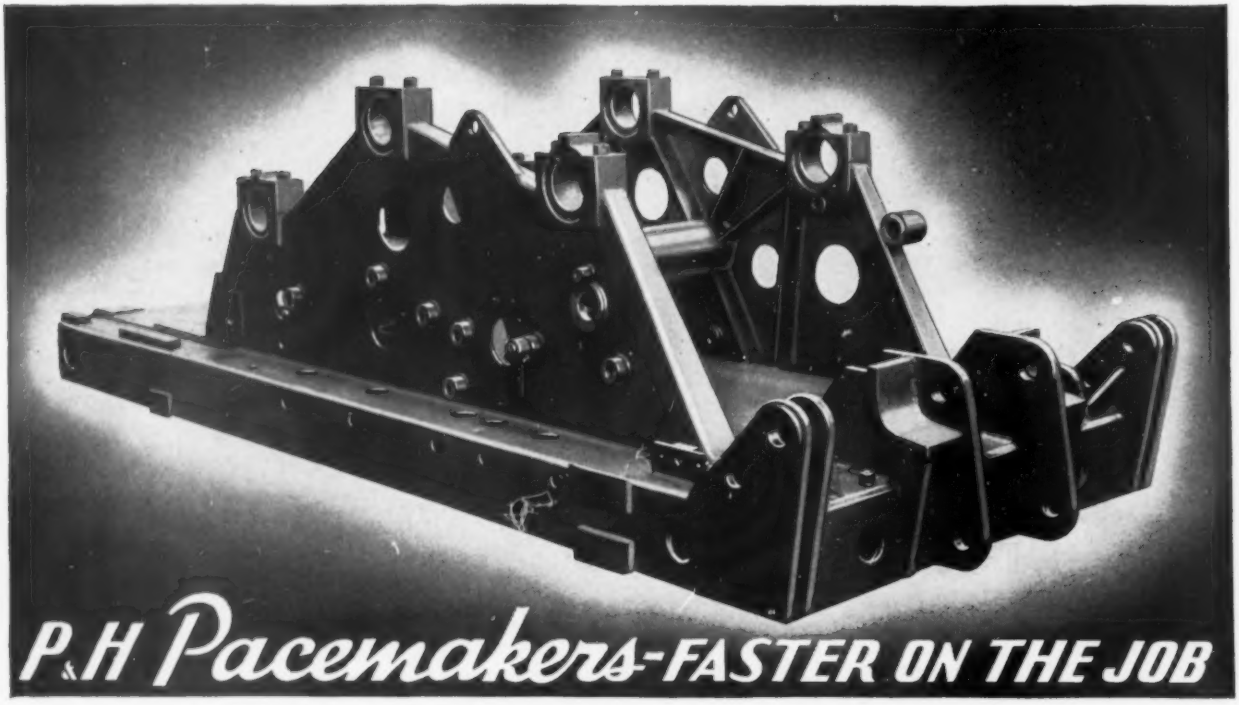

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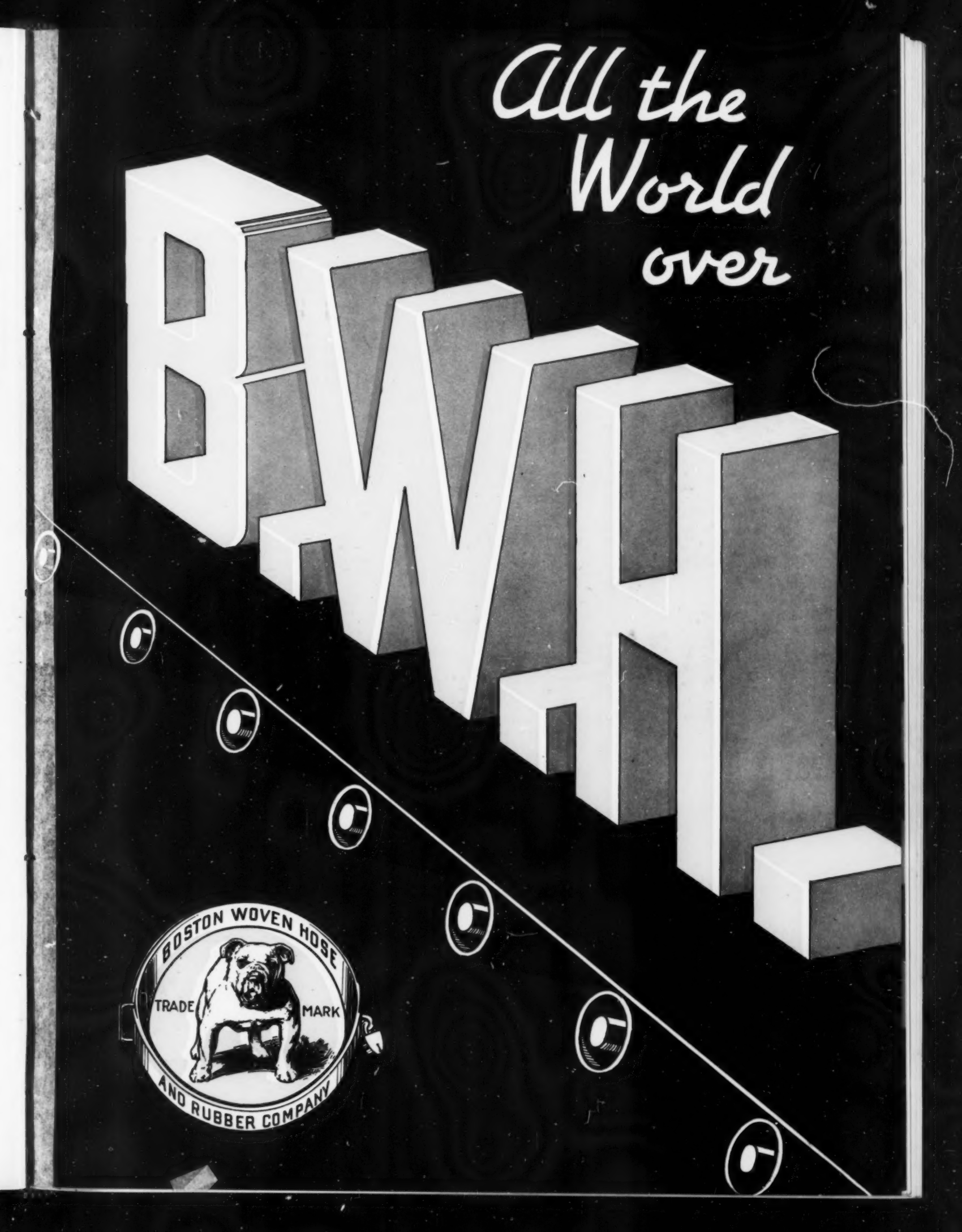
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Our Engineering Department will gladly go over your specifications and determine how you can profit by the Duplex System the most important development in the history of belt conveying.

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CLEVELAND DRILL RIG *Wins* ANOTHER BATTLE OF BULL RUN

An interesting side light on the first battle of Bull Run pertains to the large number of civilian spectators who followed the Federal army out of Washington when the advance was ordered. Senators, congressmen, other public officials, and government workers—even gaily dressed ladies—drove out to witness the first struggle of the war. Their carriages blocked roads and bridges, greatly impeding the movement of the troops. Many of the civilians were killed and wounded, and Confederate soldiers feasted for three days on the fried chicken lunches the picnickers had brought out to sustain them in their day of entertainment!

★ Down in the Old Dominion State, less than thirty miles from the Nation's Capital, there were fought during the Civil War of the sixties two of the bitterest battles of the four years' struggle. In a hundred-year-old quarry located on the historic battlefield of Bull Run, a Cleveland DR6 wagon drill recently fought another battle—against heavy odds—and won magnificently! The figures for the day—

The other drill put in 89 feet of hole, using 70 detachable bits. The Cleveland drilled 128 feet in the same time, requiring only 48 bits.

Cleveland Drill Rigs will win for you too, on any battlefield, and against all competition. Demonstration whenever and wherever you say. The DR6 is fully described and illustrated in Bulletin 111, sent on request.

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LEADERS IN DRILLING EQUIPMENT

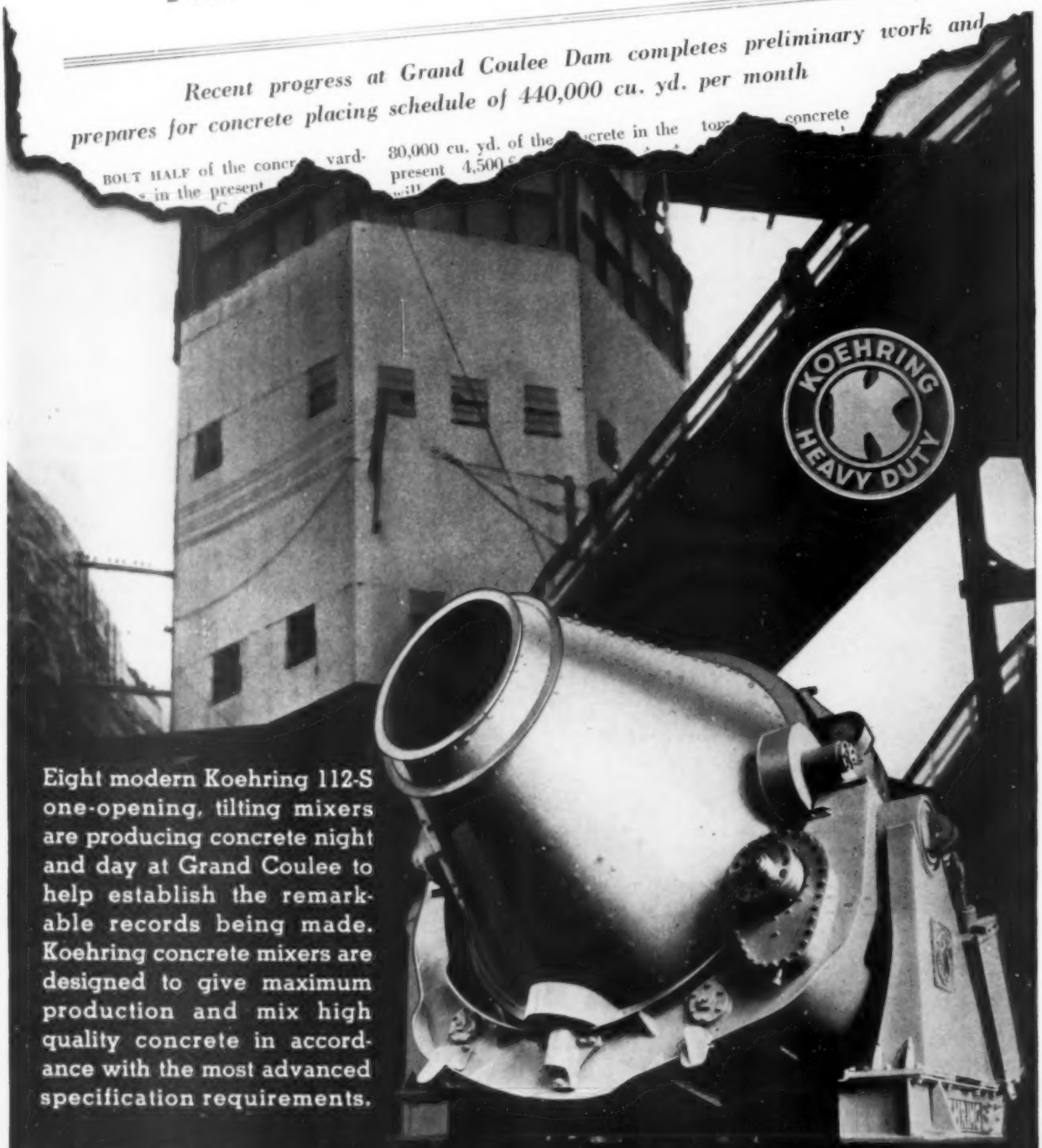
KOEHRING

July 15, 1937 · ENGINEERING NEWS-RECORD 101

New Record in Pouring Concrete

Recent progress at Grand Coulee Dam completes preliminary work and prepares for concrete placing schedule of 440,000 cu. yd. per month

BOUT HALF of the concr[illegible] yard- [illegible] 30,000 cu. yd. of the [illegible]crete in the [illegible] concrete [illegible] in the present [illegible] present 4,500 c[illegible]



Eight modern Koehring 112-S one-opening, tilting mixers are producing concrete night and day at Grand Coulee to help establish the remarkable records being made. Koehring concrete mixers are designed to give maximum production and mix high quality concrete in accordance with the most advanced specification requirements.

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How "Correct Lubrication" can save you money:

1 Curb power losses.
2 Decrease maintenance costs.
3 Improve production results.
4 Lower lubrication costs.

A MAN—and an oil drum—what's unusual about this picture? The answer is in that little red Gargoyle you see on the drum-head—

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Executives in 110 industries prove—in the smooth operation of their machines...in improved production ...in their account books—REAL ECONOMIES can be traced to Gargoyle Lubricants properly applied.

SOCONY-VACUUM

CORRECT LUBRICATION

GARGOYLE Lubricants

SAVES MONEY FOR INDUSTRY

Read what 71 Years' Lubricating Experience...the Greatest in the Oil Business...can do for You. See Next Page.

THIS MARKETING POLICY MEANS "CORRECT LUBRICATION" FOR EVERY TYPE OF PLANT

INDUSTRY ALMOST ALWAYS FINDS that the controlled use of high-grade Gargoyle Lubricants pays for itself many times over and that they actually cost less to use than ordinary lubricants.

But, for such equipment as does not justify the highest-grade lubricants, Socony-Vacuum Engineers will always recommend a lower-priced lubricant when consistent with true economy.

Socony-Vacuum, with a complete line of products, can supply the lubricants best fitted for the requirements of the individual lubricating job as determined by specific operating conditions.

Socony-Vacuum Engineers bring you years of world-wide experience and direct cooperation with manufacturers of equipment. Lubrication Profit is the inevitable result.

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The bigger the blast, the greater need for Cordeau-Bickford Detonating Fuse. Giant blasts are practically impossible without it. This powerful agent gets the maximum explosive force out of every cartridge—and the maximum work out of every shot. Any number of holes can be hooked up, the split-second rotation afforded by Cordeau insuring that exactly coordinated relief of burden which means better fragmentation. With the material well broken up, its removal is a comparatively easy and profitable operation.

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CB65

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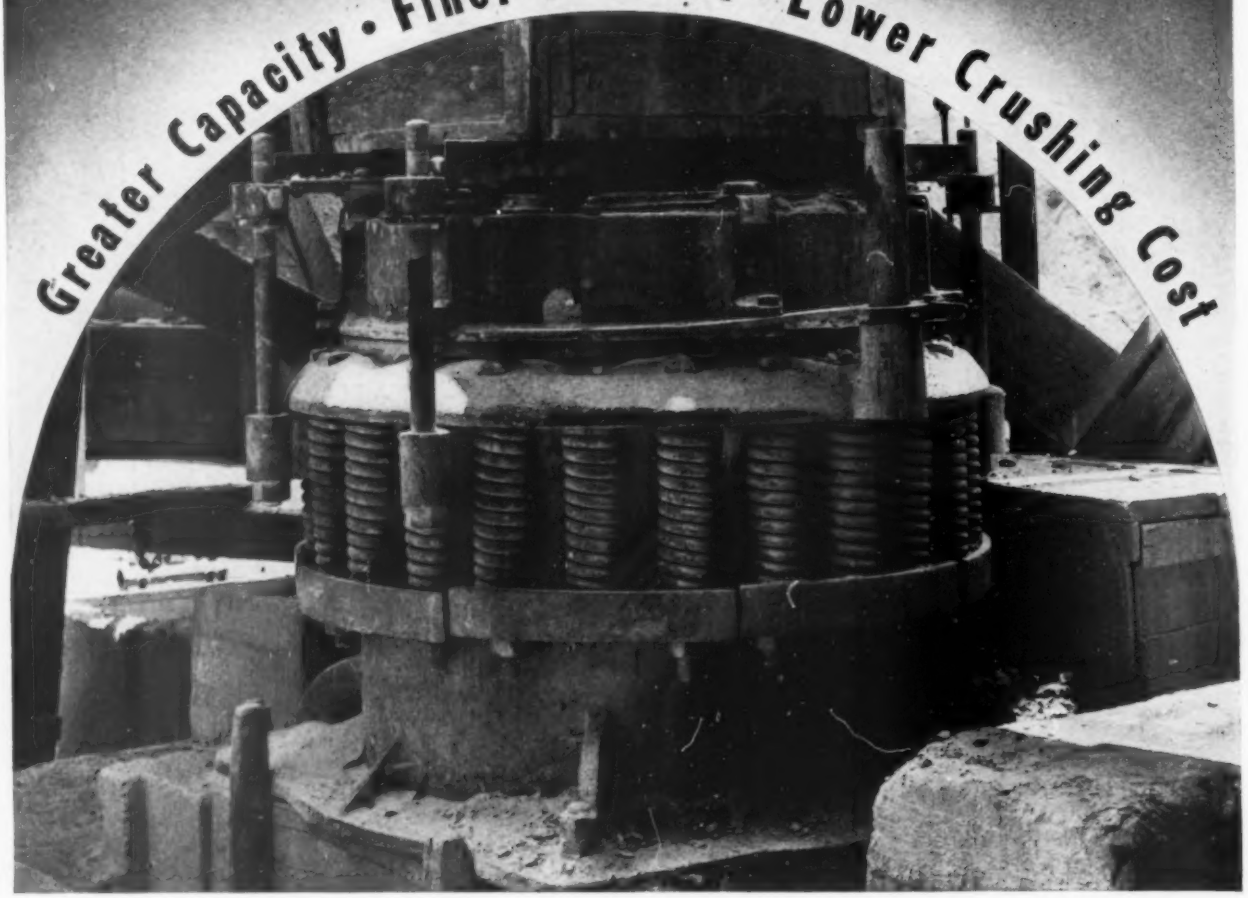

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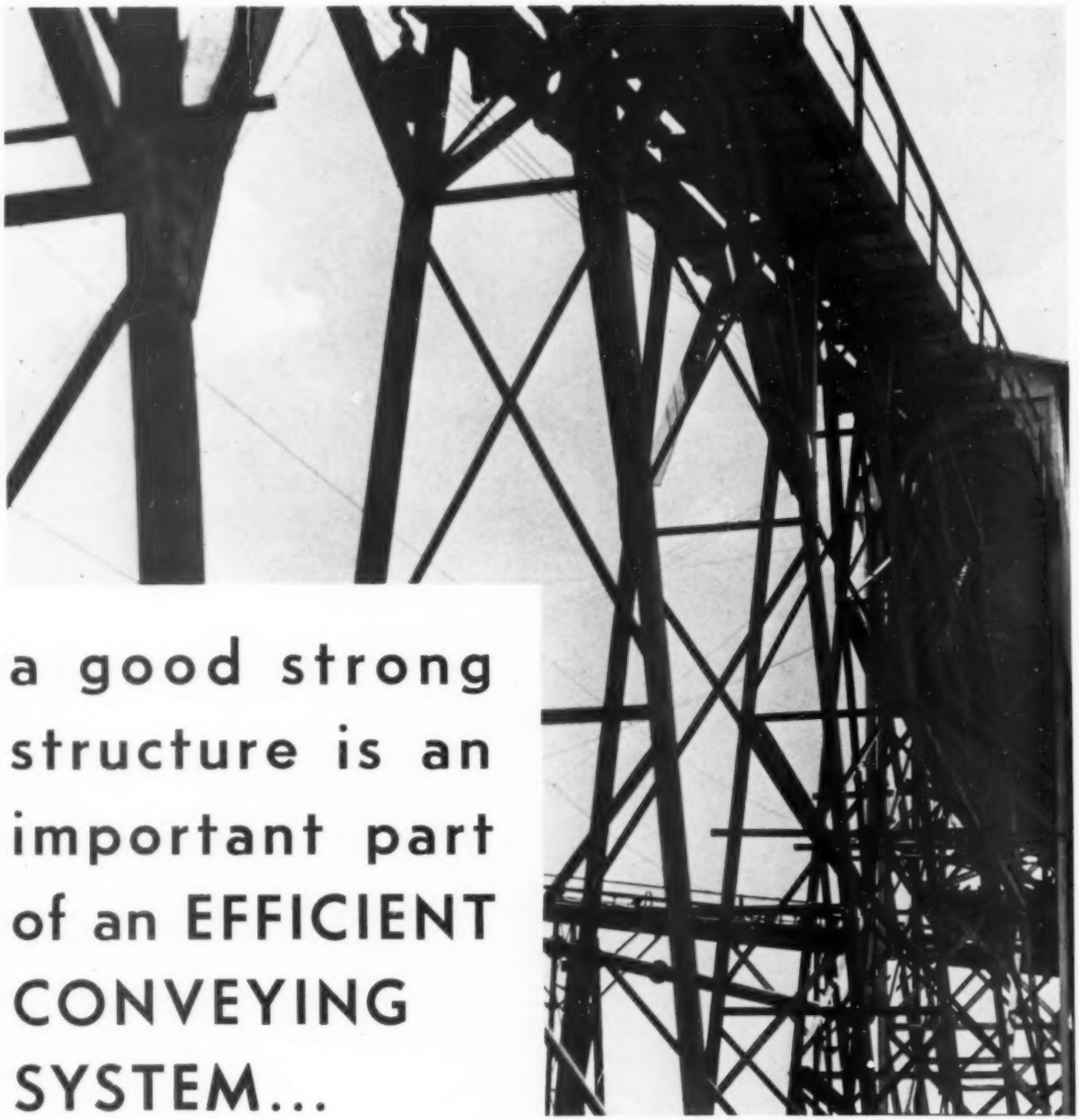

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MATERIAL HANDLING ROBINS EQUIPMENT

ROBINS CONVEYING BELT COMPANY, 15 PARK ROW, NEW YORK, N. Y.

OCT 11 1937

Rock Products

Vol. 40 Chicago, October, 1937 No. 10

What Means, "Industrial Democracy"

JOHN L. LEWIS, dictator of C.I.O., in a recent address before some high-brow gathering at Princeton University, made quite a favorable impression, even at this seat of learning largely patronized by the sons of "economic royalists." He has the faculty of making a favorable impression among intellectuals, generally, in spite of his cave-man appearance and gorilla methods of accomplishing his objectives.

Like Franklin D. Roosevelt, Mr. Lewis talks quite plausibly and occasionally logically, about democracy in industry. His theme at Princeton appeared to be: We can not have real democracy in government, or things political, without democracy in economics; meaning, in the capitalistic control of industry.

Into this theme, both the President and Mr. Lewis weave a picture of the United States Government in years past as a creature of the manipulations of wilely big business men and bankers—the economic royalists. To introduce democracy into the picture, these men insist, in vague terms, that "labor" must have a hand in such manipulations. Boiled down to the elementary, what they ask or suggest or seek is to substitute labor-chosen, or allegedly chosen, dictators for these phantom economic royalists to carry on economic experiments.

Is this industrial democracy? If it is, it is something entirely different from what the term meant less than 20 years ago. It is unfortunate that our memories are so short, for we could profit much from recent history.

In 1919, following the end of the world war, our industrial set-up was badly disorganized. The war orders ceased; thousands of men returned to industries that were not ready for them; the railways were in the hands of the government; thousands upon thousands of cars were tied up in Eastern terminals; freight rates had been raised; labor wages were sky high; and to make matters worse millions of our foreign-born citizens, particularly those from southern Europe, who had done most of our quarry work and similar jobs, were returning to their native countries, expecting to fill the boots of their countrymen slaughtered in the great war.

Home-coming American soldiers, knowing of the high wages paid to those who remained at home, demanded even higher wage scales. The railways, faced by increased costs because of the high wages granted by the government to their employes, car shortages and mismanagement generally, were asking for still further increases in freight rates. There was a tremendous pent-up building program in the offing—highways, houses, factories, everything—but nothing moved.

All kinds of measures were proposed to meet this crisis. Little that the New Deal has since tried out was not tried then. Producers' and manufacturers insisted that their prices could not possibly be reduced. They appealed to the Federal Government to justify these prices. Secretary of Commerce Redfield, acting presumably under the post-war powers of the President, did establish a commission to *fix prices* for various manufactured commodities, notwithstanding the anti-trust laws. Some prices actually were *fixed* by Federal decree—including steel and gypsum wall board. These prices, as Mr. Lewis or the President might now interpret them, were undoubtedly fixed by the "economic royalists" of these industries.

On the other hand, union labor, which was stronger at that period than at any time since, unless it be at the present moment, insisted on war-time wages, or even higher. The members of the building trades unions which had had little to do, in many instances, except the war-time carpenters, thought they saw a chance to make a killing, and asked for large increases. The Federal Government was asked to, and in some cases did, put its O. K. on these wages. Economists all over the land constantly chirped cheerfully about the *permanency* of the higher price levels, etc.

If you were in business in 1920 and 1921, do you recall what happened? The expected building boom just would not start. Building plans were laid aside. We were soon in a depression, when by every natural law of economics we should have been busy using our war profits—they were thought to be profits then—making good the lag in construction and in the peace industries occasioned by the war. Instead, there was a buyers' strike, and much of our accumulated capital was lent to Europe to rehabilitate its homes and factories—and is still tied up there!

We had then a fine demonstration of the age-old truism, translated into "economic law," that "you can lead a horse to water, but you can't make him drink." Yet 12 years later the New Dealers attempted exactly the same thing with their NRA!

While, in 1920, one branch of the Federal Government was seriously and innocently putting its O. K. on prices desired by producers, another branch, the Railway

Administration, was quietly making private deals with a few steel manufacturers for rails and other steel at very much lower prices. The Railway Administration was composed chiefly of hard-boiled railway executives who knew how some of the laws of economics work, or at least they knew the mechanics of purchasing large quantities of necessities. Their tactics, or example, eventually broke the dam, and by 1922 all attempts to maintain artificially high prices and wages went overboard, and we started the greatest period of prosperity, for every one, that this country ever saw—with the smallest labor union membership in a long time.

It was during that period of readjustment, 1919-1921, that we also heard a great deal about "industrial democracy." The world had been "made safe for democracy" with the help of American blood and guns. Labor at home was discontented. We were just past the "silk-shirt" era. Strikes and trouble were numerous and management of industry presented many problems. Industrial democracy was the theme of much writing and much talk in every industry.

For example, some employers suggested a parliamentary system of running their plants, with a cabinet composed of executives, a senate of foremen and superintendents, a house of representatives composed of delegates chosen by common labor. The suggestion was tried out with glorious results, according to B. C. Forbes, the well-known writer on business subjects, in a series of articles written at the time and, incidentally published in ROCK PRODUCTS.

By other writers and speakers democracy in industry meant largely a democratic attitude or frame of mind on the part of employers toward their employes—condescension probably is what it meant to many readers and listeners. Not a few employers in the rock products industry took the matter seriously and profit-sharing schemes were worked out.

One paper delivered at the February, 1920, annual convention of the National Sand and Gravel Association in Chicago stands out very clearly. It was made by a man not given to making speeches. In fact, he had some one else read it, due probably to innate modesty. But it was sincere and from the heart. The author was F. D. Coppock, president of the Greenville Gravel Co. (now the American Aggregates Corp.). Among other very pertinent remarks were these:

The views which I express in this paper are the result of my convictions formed during the past seventeen years of constant contact with labor, and from different positions, as laborer, as foreman, superintendent, and finally as an employer.

I believe that the great army of employers in the country, regardless of the number of men they employ, and the nature of labor to be performed, will soon realize the necessity of greater industrial democracy. The absence of democratic ideas, the absence of personal consideration, the lack of contact and interest in the simple everyday affairs of the employed, the social distinction exacted by the employer, are labor's excuses for the lack of real interest in the affairs of the employer. It must be obvious therefore that the responsibility for the resulting dissatisfaction and unrest falls on the employer. It is natural that if we treat laborers as mere tools without any interest in their personal affairs, that they in turn will treat us as a machine, and without any personal interest in our affairs.

Did you ever stop to think how much we cater to bank officials in order to secure the use of $25,000 in money? At 6% this money costs you the same per day as one laboring man. The laborer is just as essential to your operation as the money. This is one way to determine the value of labor.

An organization employing 20 men to carry on its operation should consider the securing and retention of this labor fully as important as the borrowing of $500,000, because that is exactly what the men are worth, measured by the fact that we pay the men for their labor as much as we pay for the use of the money. Believe me, we would palaver and cater to every member of a banking organization, from the janitor to the president, that would lend us this amount of money for use in a plant requiring only 20 men. We would be playing "500" with the cashier's family, golf with the president, and poker with the Board of Directors. We would go out of our way to extend pleasant greetings and be nice to them; we would drop in to see them personally on matters which might have been attended to by 'phone or letter—we would never think of sending a time-keeper or an office boy to see them. We don't need to borrow $500,000 to run one of our plants, but we do need the 20 men; yet, how much consideration do we give them, how often do we go out of our way to accommodate them or to please them?

* * * * * * * * * * * *

A common saying is that the more you kick a dog, the more he likes you. This is not true, but it goes to show how much kicking the dog will stand for after you have made a friend of him and a home for him. Did you every try kicking a strange dog? Don't do it, for if he is a worthwhile dog, has any backbone or get-up about him, he will bite you, or at least snarl and growl. I believe this same thing applies to men. We want a man with backbone, and admire those who stand up for their rights and have self-respect enough to at least want to be treated fair.

As a usual thing our dogs, at times, get a lot of attention—we pat them on the back, caress them, etc., and they seem to realize the condescension on our part and in return for this personal interest, they form a love and attachment for us that you can't kick out of them. The trouble is that we don't treat our laborer with the same expression of friendship and kindness that we do our canine friends. We growl and kick a lot at the laboring men, but we forget that they are strange dogs. This is just my way of emphasizing the value of personal contact, and I beg the laborer to pardon the comparison.

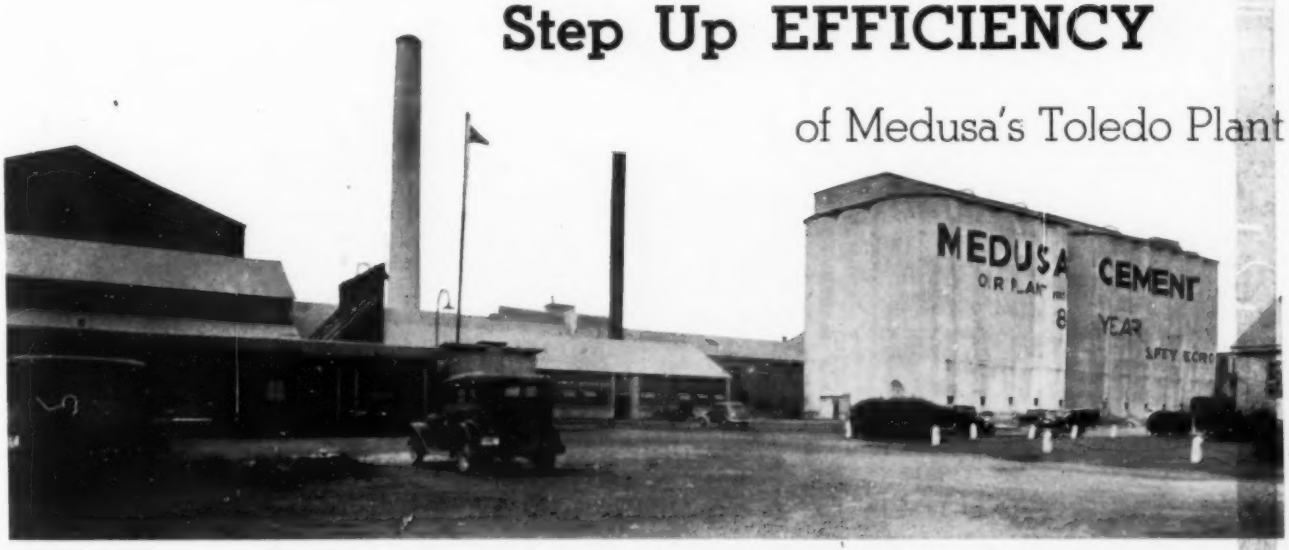
To our mind Mr. Coppock expressed what "industrial democracy" really means. In the decade of material prosperity following 1920, most of us lost sight of these fundamentals of happy industrial relations as well as of the fundamentals of economics. The present attempt to resurrect them by federal law and edict, to our way of thinking, will prove just as fruitless as the earlier attempt in 1919-1920. In fact the attempt to impose *a frame of mind* by law has just the opposite effect, due to the well-known perverseness of human character.

We need a better and clearer definition of industrial democracy than Mr. Roosevelt and Mr. Lewis have yet expressed, or possibly have even conceived, although we think that what they have in mind is really a social leveling process; but their method of approach is just as round-about as some of the schemes previously proposed by industrialists.

Employers, as a whole, muffed their opportunity once and paved the way for what we have today, not so much by the panic of 1929 as by their indifference to these fundamentals in the years preceding the panic. But we do not think it is too late for them to be converted to genuine "industrial democracy," because most really big business executives are at heart democratic in manner and spirit. They were just too darn busy making money to see—and where are those profits now?

Step Up EFFICIENCY

of Medusa's Toledo Plant



View of the Medusa mill at Silica, Ohio, where many improvements have been made

A MODERNIZATION PROGRAM, extending over the past two winter seasons, has been practically completed by the Medusa Portland Cement Co., Cleveland, Ohio, at its Toledo (Silica) Ohio plant. The changes are part of a general program of modernization which has been carried out by Medusa in several of its plants that have been described in a number of recent issues of ROCK PRODUCTS.

Improvements at the Silica, Ohio, plant comprise the revamping of the entire raw grinding department (wet process plant), addition of two-stage clinker cooling, the installation of heat-recuperating equipment on the kilns, direct firing of coal in the kilns, and the introduction of air separation in closed-circuit with the clinker grinding equipment.

These improvements have increased the general operating efficiency of the plant, have reduced operating costs, increased the grinding capacity for both the raw and finished products and have effected a more uniform, easier-grinding product.

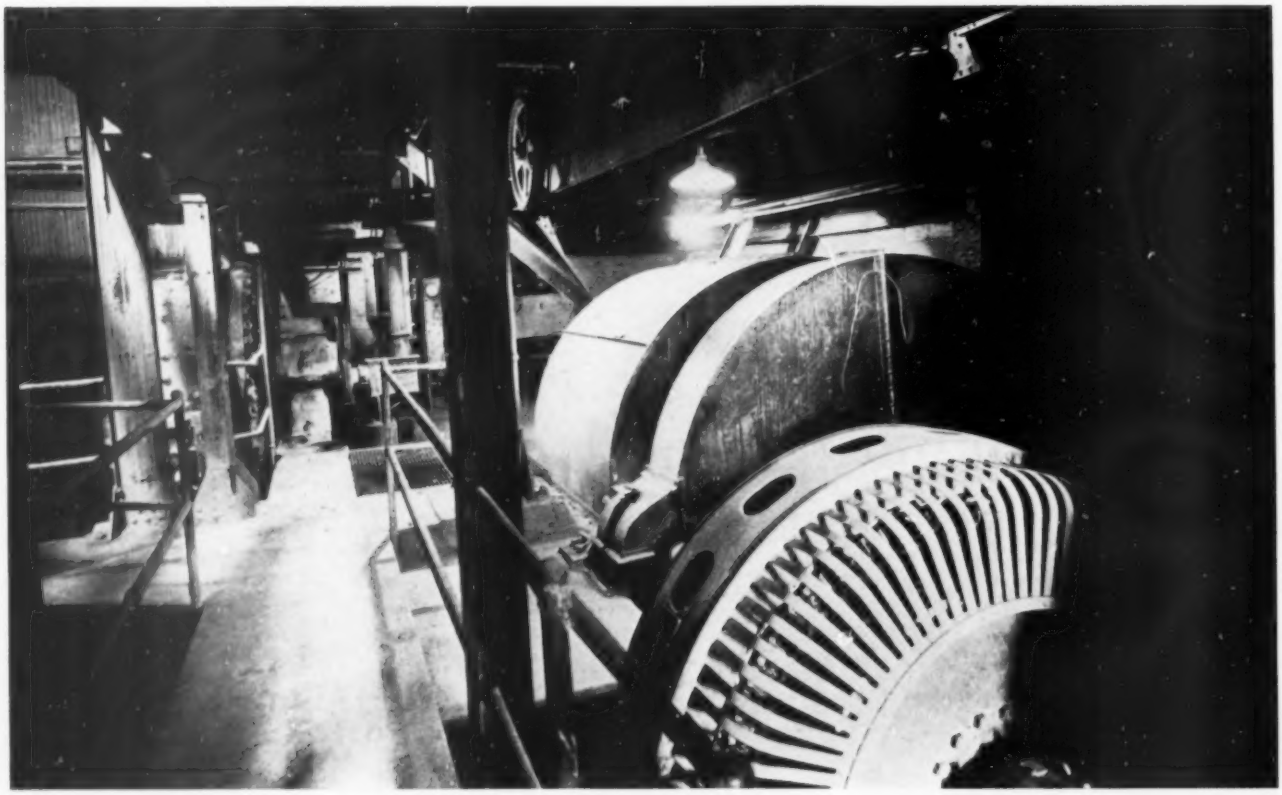
Two of the vibrating screens which are close-circuited with the Kominuters

Convert Compartment Into Tube Mills

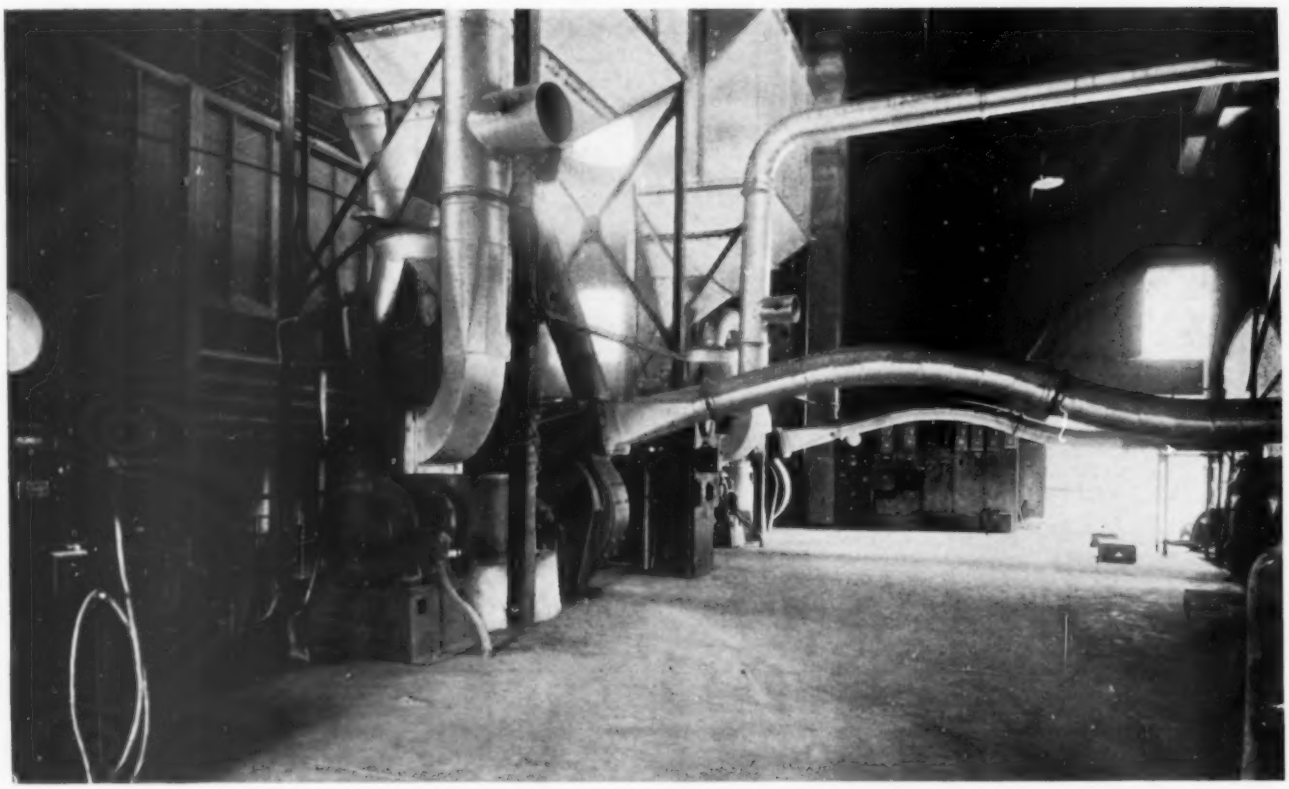
Before the raw grinding department was revamped, the slurry was pulverized in three peripheral discharge 7- x 22-ft. compartment mills, and then pumped to storage silos for the kiln feed. To give a more uniform kiln feed and to eliminate large particles going to the kilns, the No. 2 compartment mill was removed, the other two were made over into tube mills with center end discharges, and two type 85 kominuters were installed for preliminary grinding. A 150-bbl. capacity concrete slurry storage tank was constructed in the space made by the No. 2 compartment mill's removal, for storage of slurry when the Kominuter output exceeds that of the tube mills.

Stone (½-in. minus) enters the feed end of each Kominuter from a 75-ton bin above by means of Jeffrey-Traylor 36- x 36-in. vibrating feeders. The feeders are readily adjusted to vary the rate of feed to the Kominuters. Clay and water (35 percent of mix) are, of course, also introduced to the feed end of the Kominuters.

Each Kominuter is closed-circuited with three Tyler single-deck Hum-mer screens equipped with Ton-Cap screen cloth. The Kominuter discharges are elevated by two bucket elevators 35-ft. centers to the screens. The screen through (99 percent passing the 30-mesh sieve) go to a common trough, equipped with agitators below the screens, which is the feed for the tube mills.



One of the new Kominuters installed at the Medusa plant



Three new direct-fired coal mills with feed pipes leading to kilns

A slight amount of water is added to wash the rejects through a trough back to the feed end of each Kominuter. Each of the two mills has a capacity of 100 bbl. of slurry of a fineness of 97½ per cent passing 100-mesh. The capacity of the raw grinding plant previous to the new installations was 180-bbl. of slurry. A 3-in. Wilfley slurry pump elevates the tube mill discharges to storage. The kiln capacity is 135 bbl. of clinker per hour for the three kilns.

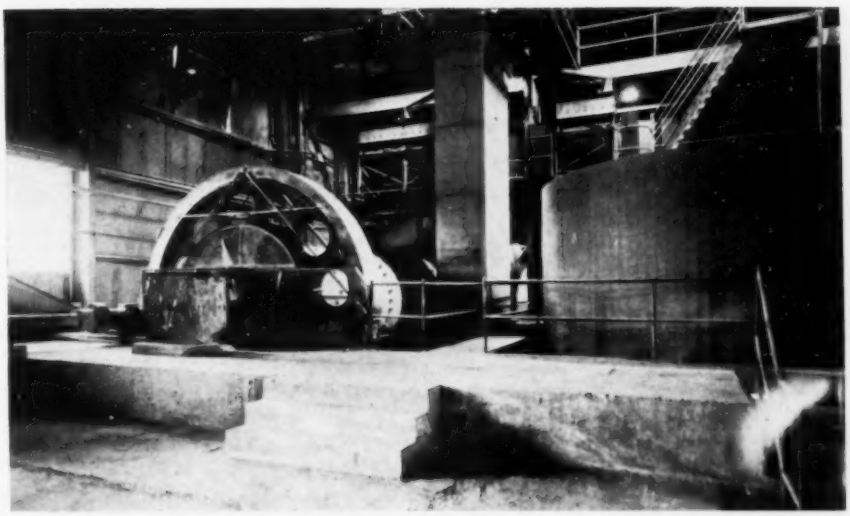
Besides increasing the raw grinding capacity and decreasing the needed operating time of this part of the plant, the resultant clinker is very small and uniform, increasing the clinker grinding efficiency considerably.

Two 1600-bbl. concrete slurry storage tanks have been built to replace two steel tanks of similar capacity. In addition to these tanks, the plant has other storage capacity for 8000-bbl. of slurry. Slurry is pumped to the kiln feed by a similar 3-in. Wilfley pump.

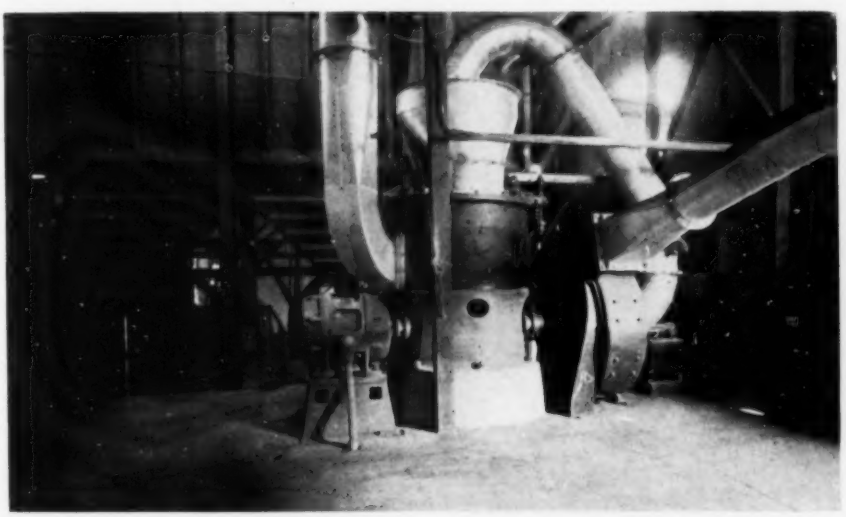
Clinker Cooling Improvements

Each of the three 10- x 150-ft. kilns was equipped with a new type CI Vanderwerp recuperator to suddenly quench and reduce the temperature of the clinker to speed up and facilitate the grinding of clinker into cement. All of the air for combustion is introduced through the recuperator plates.

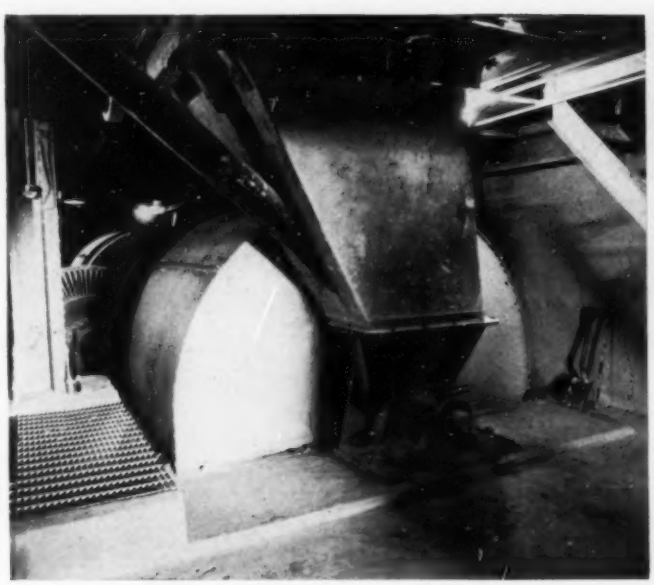
With the improved cooling facilities, the clinker temperatures are quickly reduced from 2500 deg. F. to 1000 deg. F. through the recuperators before discharging to the original rotary cooler. Here the temperature is dropped to 200 deg. F. Clinker discharging from this cooler is placed by Peck conveyors into three 1000 bbl. bins.

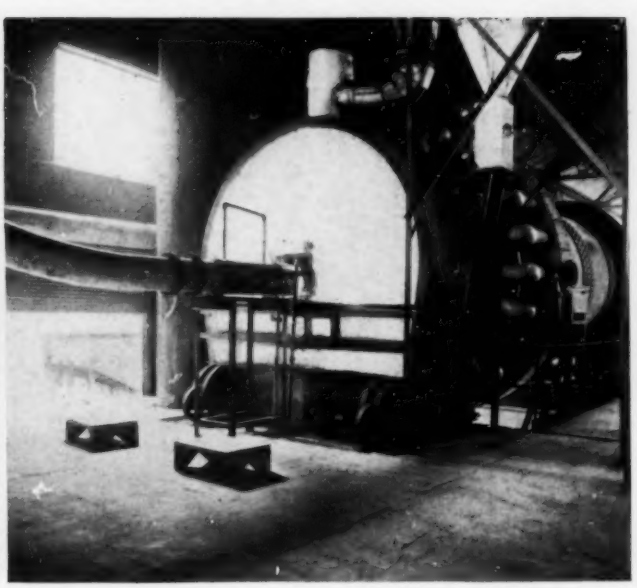


One of the Compeb mills connected to tube mill. Large tank used to store surplus production from Kominuters. Screens are located above in the background



Looking at the firing end of coal mill



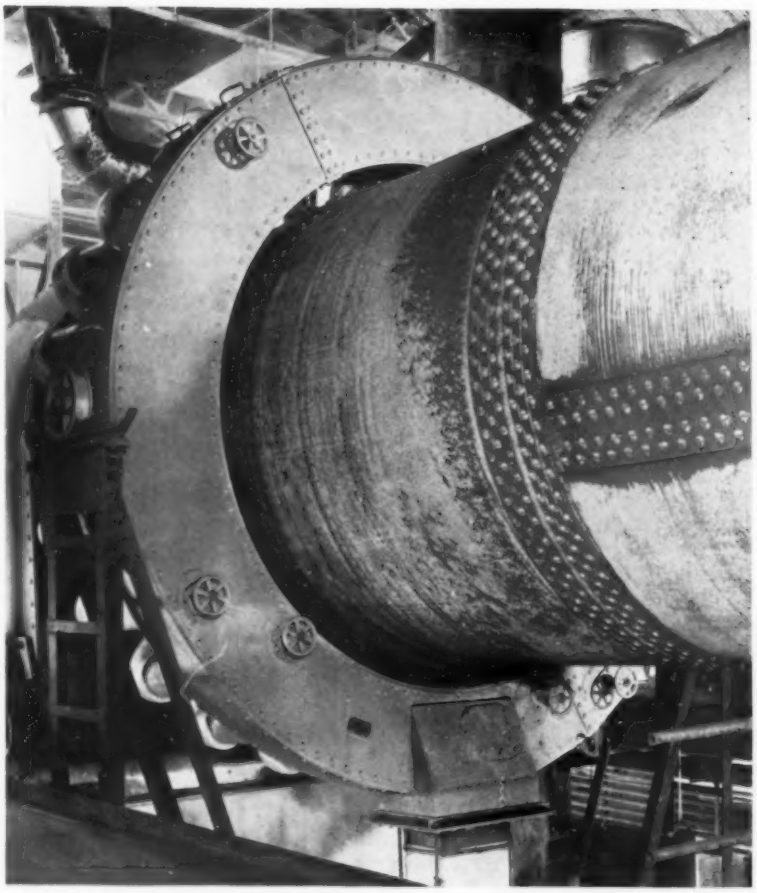


Left—End view of Kominuters with vibrating feeder above. Right—Recuperator installation on kiln reduces clinker temperature

Prior to the installation of the recuperators, the kilns each discharged directly to a 6- x 60-ft. rotary cooler, equipped with lifters, and the temperature of the clinker discharging from the cooler was about 550 deg. F.

Simultaneously with the installation of recuperators, each kiln was equipped with a Raymond No. 42 direct-fired coal mill, installed on the firing floor. About 30 percent of the combustion air in the kilns is pulled from the kiln hoods through Raymond 5-ft. cyclone dust arrestors and utilized for drying the coal and injection into the kilns. Dust (clinker) collected in the cyclones is placed in the secondary or rotary coolers. Each coal bin over the Raymond mills has a capacity of 30 tons. Coal injected into the kilns has a fineness of 98 percent through the 100-mesh.

In the finish grinding department, an 18-ft. Raymond air separator was installed in closed-circuit with two of the 7- x 22-ft. compartment mills, while the third mill may be operated in either open circuit or closed circuit with the separator. Normal demands are met with the two mills. The clinker feed to each mill is regulated by a variable speed motor driven, belt feeder, with a constant slot opening, and is synchronized with the gypsum feed. The finished grinding capacity has been increased by about 33⅓ percent through the installation of air separation.



Above—Recuperator installation looking toward firing end of kiln. Right—View in kiln looking toward discharge end, showing liner plates through which air is admitted under load. By having the heat exchange take place within the kiln, the clinker is cooled and its heat recovered by the combustion air without an opportunity for outside losses to occur

Hoist house for slackline cableway excavator

Electrify and Double Capacity of GRAVEL CRUSHING PLANT of H. W. Koch and Son

COMPLETE ELECTRIFICATION of its plant and doubled capacity has been completed in a program of modernization during the past two winter seasons by H. W. Koch and Son, sand and gravel producers, at Wapakoneta, Ohio.

Since the plant started operations in 1923, it has been powered by gasoline engines. New equipment, however, was installed in the spring of 1936 increasing the capacity to 400 tons of sand and gravel in eight hours. All gasoline engines were discarded early in 1937, and electric motors, totalling 125 hp., were installed to drive all equipment.

The company has 240 acres of gravel land which is being excavated by a Sauerman slackline cableway excavator. Stripping is being done by steam shovel and trucks. Simultaneously with the installation of equipment to increase the capacity of sized material, the Pioneer ¾-yd. bucket was enlarged to 1-yd. capacity. A new 85-ft. steel derrick was erected, the excavating bucket being operated by a two drum, two speed Flory hoist. At the same time a new frame hoist house was built for this equipment.

Karl Koch standing in front of new truck equipped with tandem drive

Produce Crushed Gravel

Present workings are 600 ft. from the plant, and material is being excavated to a depth of 50 ft., and 35 ft. below the water table. The bucket discharges to a 20-ton hopper through a bar grizzley with 6-in. openings. A Telsmith feeder regulates the flow of material to a Deister Plato 4- x 6-ft. triple-deck screen.

Stone retained on the top deck (1- to 6-in.) is chuted to a Cedar Rapids 9-x24-in. jaw crusher. Stone passing the top deck and retained on the second deck (½- to 1-in.) is chuted to a Greenvillle 16-x20-in. roll crusher.

Left—Rebuilt and improved sand and gravel plant. Note mast and cables for slackline cableway excavator. Right—Sand and gravel deposit with hoist house in background

Sand drags facilitate drying, one being used for concrete sand and the other for mason's sand

Stone passing the second deck and retained on the lower deck of the screen (½- to ¼-in.) goes direct to bins. The minus ¼-in. material is split over a small gravity screen to two Morrow sand drags. Concrete sand is made in the 24-in. sand drag, and mason's sand in the 20-in. drag. Wash water is furnished to both screens by a 3-in. Weiman pump.

Throughs from both crushers are elevated by a Columbus Bucket elevator, 17-ft. centers, to another Deister Plato 2½-x4-ft. triple-deck screen and four separations of crushed gravel are made, all dropping directly to bins.

The process described above has made it possible to meet the crushed gravel specification requirements of Ohio, Indiana and other states.

Storage capacity is 500 tons in eight bins, in addition to open stockpiles. The hoist is driven by a 50-hp. motor; 30-hp. and 15-hp. motors drive the jaw and roll crushers, respectively; the water pump is driven by a 15-hp. motor; the 4-x6-ft. screen has a 5-hp. motor; and 2-hp. motors drive the 2½-x4-ft. screen, each sand drag and the Telsmith feeder.

All shipments are made by truck. For hauling, the company owns five trucks of various capacities. Short hauls are made in two Dodge 2-ton trucks, a Ford 1½-ton truck and a Chevrolet 1½-ton truck. Longer hauls are generally made in a new Chevrolet equipped with a Thornton tandem drive. This truck has a capacity of 10 tons of sand and gravel.

Improvements

CONNECTICUT AGSTONE CO., Danbury, Conn., producer of pulverized agricultural limestone, recently increased capacity by installation of a new Bradley 3-roll pulverizer.

Adds Sand and Gravel Facilities

COMMERCIAL ROCK CO., Upland, Calif., has purchased 10 acres of land at Campus Avenue and Fourteenth Street, and work is under way on a new office building at this location. The additional land also will provide a location for stock piles of sand and gravel. At present the company operates from a small office building near its rock crusher plant.

Add Iowa Plant

WINONA SAND AND GRAVEL CO., Winona, Minn., has erected another plant at Rockford, Iowa, which started operation about July 1st. The new plant is portable.

New Owners

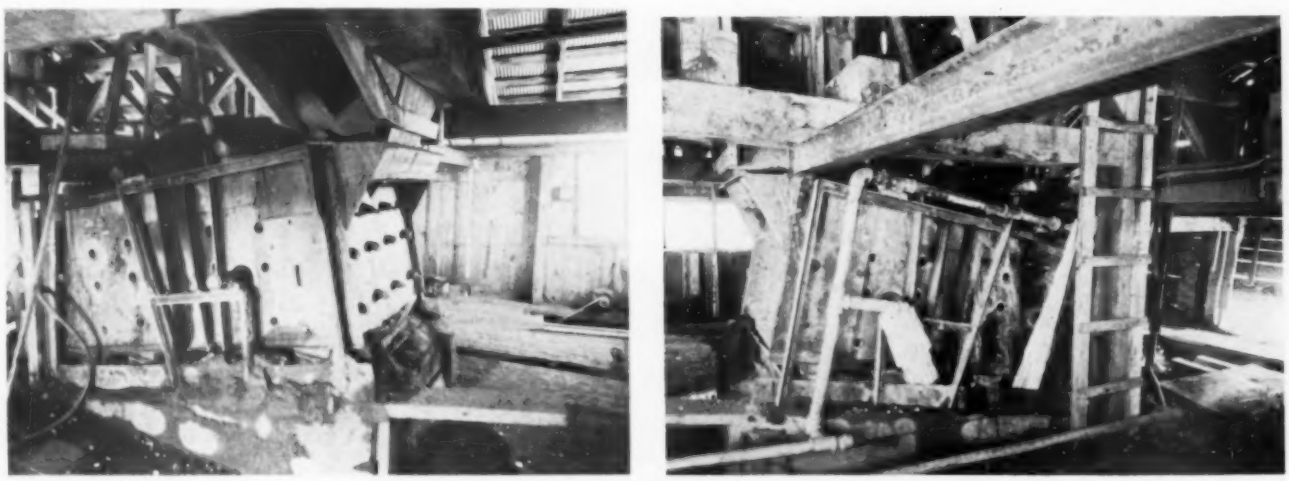
WAUSAU SAND AND GRAVEL CO., Wausau, Wis., was recently taken over by Charles P. Biesanz of the Winona Sand and Gravel Co., Winona, Minn. Other officers are Mrs. Florence Schott, vice president, William Biesanz, secretary-treasurer, and Roy Tschumper, general manager.

Grant Sand Dredge Permit

THE C. C. PATTERSON CO., Pittsburgh, Penn., has been granted a permit to dredge sand and gravel in the Ohio River from Pittsburgh to Kittanning, Penn.

Three Shifts in Gravel Plant

THE MISSOURI SAND AND GRAVEL CO., has been operating its plant on Hadley Creek near Barry, Ill., on a 24-hour a day basis since April. It has a payroll of $2300 a month.

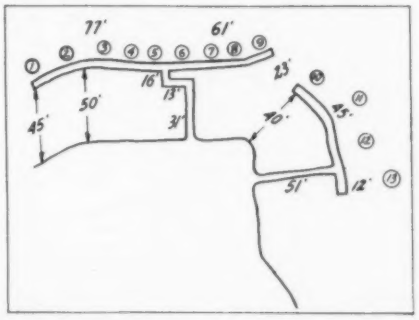


Two views of triple-deck screen at the Koch plant

Tunnel Blast

ONE OF the largest blasts yet made with du Pont's new safety explosive "Nitramon" was made September 25 at the John T. Dyer Quarry Co. trap-rock quarry at Monocacy, Penn. Through the courtesy of E. T. Wolf, one of the explosive experts of E. I. du Pont de Nemours & Co., we are able to show some views of the quarry face and the results of the shot, together with the method used for loading the tunnels.

The shot was a difficult one to make because it was in a "corner," as the diagram shows. The 32,500 lb. of explosive was placed in 13 charges as shown by the consecutive numbers on the sketch. The loading was completed in five hours and approximately 80 tons of stemming were placed in the adits in 16 hours. The burden was calculated at 130,000 tons, and it is estimated that 150,000 tons of rock was brought down.



Fluorspar

ST. LAWRENCE CORP. OF NEWFOUNDLAND, LTD., is operating a small fluorspar mine at St. Lawrence which is said to have much possibility, according to reports coming from Canada.

Addenda

In the article about the New Pennington Trap Rock plant in ROCK PRODUCTS, September, 1937, page 37, credit for designing the plant and purchasing the new machinery should have been given to Earle C. Bacon, Inc. Mention also should have been made that two Traylor and two Farrel crushers made up the secondary crusher battery.

LEFT: Before blast, showing corner of the quarry drilled. ABOVE: After the blast. RIGHT: Close-up of corner after the blast. BELOW: The 32,500-lb. of explosive in action at the Monocacy, Penn., quarry of the John T. Dyer Quarry Co.

Unique Blower System

REMOVES DUST

In Stone Plant

Above—Stewart Perry at the left on the scale platform and his weighmaster at the right. Right—New crushed stone plant

FORCED TO ABANDON his quarry within the city limits, due to objections to blasting in a growing residential district, Stewart Perry, Winchester, Va., crushed stone operator and contractor, opened a new one outside the city limits and built a more modern plant. The new plant has a capacity of 400 to 425 tons of sized stone in 10 hours, but has been operating in excess of 20 hours daily, ever since it went into production in May, 1937.

Twenty-five acres, containing a dark hard limestone, were purchased. The new quarry is being worked on a 40-ft. face, drilling being done by a well drill and Ingersoll-Rand wagon drills and Jackhammers, with well drills used for the heavier shots.

Cut Handling Costs

Stone is hand-sledged and loaded into Lambert automatic skip buckets spaced at different points in the quarry. Ten of these buckets of 1-yd. capacity each are hauled to the crushers by two International trucks. By this method, Mr. Perry has found that he can pick rock to pass state specifications and avoid inferior stone. The cost of sledging and hand-loading has averaged 14 cents per cu. yd. of stone, with two men assigned to each bucket, and according to Mr. Perry, has cut a third from the cost of track, boxes and cable hoist to the crushers.

The plant was designed by Mr. Perry so that it may be operated as two independent units, either in the event of a temporary falling off in business or a break down in machinery. The trucks carrying skip buckets may back up to

Blower taking stone dust direct from screen

Fan of blower system which removes dust throughout plant

either one of two crushers set side by side, each crusher serving its own sizing screen.

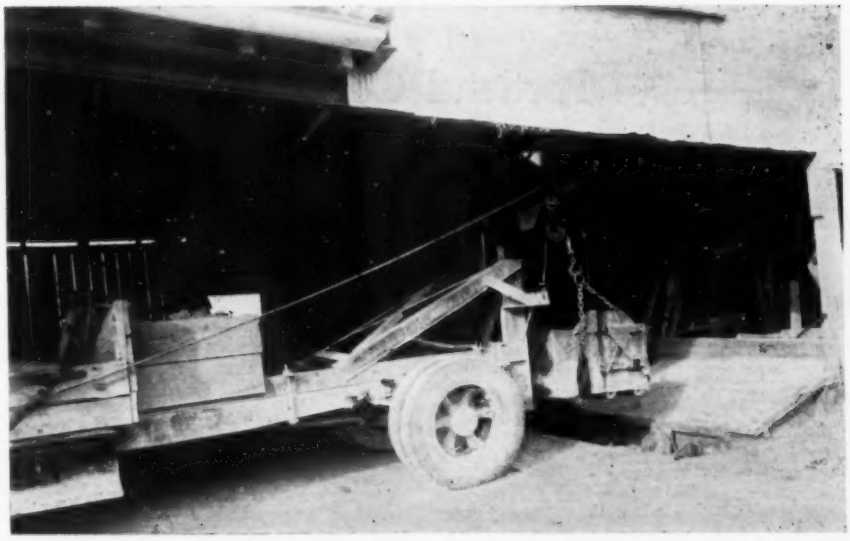
The larger of the crushers, a Diamond Iron Works 15- x 36-in. jaw crusher driven by a 100-hp. motor, is generally used when larger rock sizes are being hauled from the crusher, although the other crusher, a Good Roads Champion 10- x 30-in. jaw crusher driven by a 30-hp. motor, may be used for that purpose, if needed.

A home-made, bucket elevator, 40-ft. centers, driven by a 5-hp. motor takes the throughs from the larger crusher and discharges to a 24-ft. by 36-in. New Holland rotary screen, where four stone sizes are made. These sizes go direct to bins below the screen, while the 5- to 6-in. tailings return to the 10- x 30-in. crusher to be broken for No. 9 stone (¼-¾-in.).

A 20-ft. home-made bucket elevator takes the throughs from this crusher to a Diamond 36- x 20-in. roll reduction crusher, and the throughs from this crusher are elevated to a Diamond 3- x 10-ft. double-deck vibrating screen. The smaller stone separations are made over this screen.

The plant has five bins for sized stone with a total capacity in excess of 300 tons and two small bins for tailings. Tailings have a large market for application on blacktop and water-bound macadam roads and for miscellaneous uses.

When the plant is operating at full capacity, either primary crusher is used, although whenever possible the larger stone is discharged into the larger crusher. On a curtailed production schedule, if the demand is for large stone, this crusher is used, while a demand for smaller sizes will cause the use of the smaller crusher.



Quarry skip suspended at the end of truck has unique arrangement for discharging stone to crusher

Dust Removal System

A dust removal system in the screening plant has made this department comparatively free from dust for a dry operation. A 52-in. Dixie Blower fan pulls dust from the top of each elevator at the point of discharge, and from the crusher discharges and from the top of the vibrating screen. The fan is driven by a direct-connected 25-hp. General Electric motor through a flexible coupling. Although at present the fan discharges into the air, at a later date these fines will be recovered by suitable equipment.

When the stone bin for any particular size is filled, stone is removed and stockpiled by truck. Larger sizes of stone may be drawn from the stone bin into trucks in a similar manner and dumped into the smaller crusher. An Austin-Western ⅜-yd. gasoline shovel on crawlers does the stripping and loading from the stockpile.

Three air compressors are needed to meet the quarry requirements.

A Blaisdell 10- x 8-in. compressor driven by a 35-hp. Westinghouse motor; a Sullivan 9- x 8-in. compressor driven by a 20-hp. motor; and a Chicago Pneumatic portable compressor are used together as a unit to compress the needed air to 110 p.s.i. The motors required for all operations total 312-hp. Two 5-ton Ford trucks and five 6½-ton International trucks are used for hauling, there being no rail haul.

Hand picking stone into quarry buckets for delivery of selected material to crusher

Portland Cement Association Study of

Absenteeism Among Mill Workers

Provides Reassuring Data

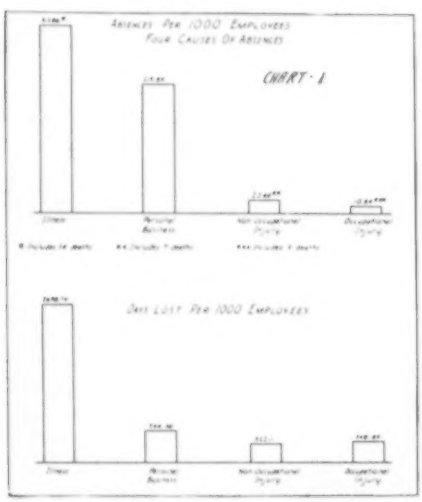
EVERY DAY at least a few workers are absent from their accustomed places in almost every mill. Whether they send word that they are prevented from working by illness, accidental injury or some other cause, the certain effects are the same: Production is interrupted, operating efficiency is lowered, wages are lost, and to all practical intents the day is usually thrown away so far as the absentees are concerned. Sometimes physical suffering can be added. The single word which best covers these effects is *waste*. Absenteeism is a major waste in industry.

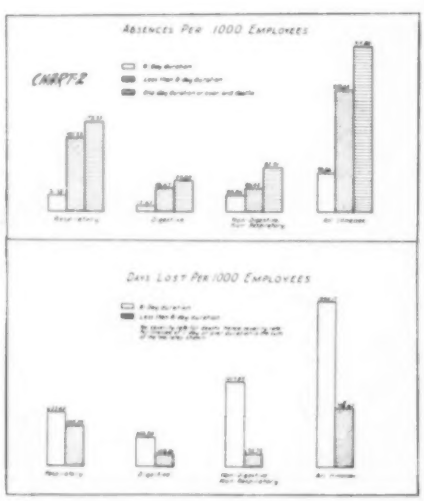
Waste must never be tolerated anywhere, least of all in industrial operations. To attack absenteeism is to fight waste. An exact knowledge of absenteeism is a necessity if any industry is to free its workers and itself of the unnecessary losses caused by interruption to earning capacity and income.

Further, a detailed study of absenteeism, indicating what diseases and disease types are found among its employes and how serious the experience with each may be, may be of very great value to dusty and other industries popularly accused of fostering certain ailments or of exposing employes to disease of one kind or another while pursuing their occupation. Records which show the cause of loss of time from work indicate exactly what physical trouble is being experienced by employes and how much loss of time and other wastage it causes. Is the incident of various diseases heavier among your industry group than for the community in which located, or is it heavier in your industry than for comparable individuals over the country at large? Is it average or for some diseases is it lower?

A relatively high rate discovered for a given disease may mean that the industry process or surroundings is to blame. Of course, that may not be the case. But even if the industry is not *fairly* chargeable, it should not be forgotten that sooner or later such health abnormalities may be attributed to it. Conversely, disease rates for an industry, discovered to be lower than the average, surely must prove most useful to such industry if called upon to defend itself against the charge of disabilities attributed to such disease.

If an industry's records show the principal reasons for employe absence, it is ready to undertake corrective measures. The nature of these measures necessarily depend upon the causes.





Charts 1 and 2. Showing absences per 1000 employes and the respective causes

PCA Study For 1936

The Portland Cement Association has just completed its second absenteeism study in member plants, covering the year 1936. The study is based on statistical information gathered in 53 typical plants, well distributed geographically over producing areas of the United States and Canada. So few industrial studies of this kind have been made that the cement report may be considered almost unique. The previous study in the cement mills, covering 1935 experience, was of a more or less experimental nature.

Illness absenteeism in the cement industry during 1936 was analyzed according to the classifications followed by the U. S. Public Health Service, the three major divisions being:

1) Respiratory illnesses
2) Digestive illnesses
3) Non-respiratory, non-digestive illnesses

In addition to illness absenteeism, the report also covers absences due to non-occupational injury, occupational injury, and personal reasons. Chart 1 presents two very interesting comparisons of the extent of absenteeism from these four causes. It will be interesting to note that while illness is the most frequent cause of absence, occupational injury is the least frequent. Twenty years ago, before the Association had undertaken accident prevention to any great extent, it was not infrequent for a plant force to lose more time through accidents than through illness.

Respiratory Illnesses Lead

As in the case of the general population, respiratory illnesses were a more frequent cause of absence than either of the other two major illness classifications. There were 31.38 respiratory illnesses lasting eight days or longer for

every 1000 employes, quite in accord with usual health experience in industry. Respiratory illnesses lasting less than eight days show a frequency rate of 140.53 illnesses per 1000 employes. There were nine deaths attributed to respiratory diseases, seven to pneumonia, one to tuberculosis and one to other respiratory diseases. This is the equivalent of 1.5 deaths per 1000 employes. The frequency rate for all diseases in this class, including deaths, is 173.55 per 1000 employes.

Respiratory illnesses lasting eight days or more caused 623.43 days loss of time per 1000 employes, while those of less than eight days duration caused a loss of time of 409.08 days per 1000 employes. Both frequency and severity of these respiratory sick spells varied considerably with the calendar as Chart 3 shows. These variations, it may be borne in mind, are in accord with generally observed experience with the population at large.

Recalling the old suspicion that the dusty atmosphere around mills and quarries might promote respiratory illness, Chart 4 provides evidence that this is not the case so far as cement plant dusts are concerned. Increased production of cement brings a corresponding increase in dusts given off into the atmosphere; warm dry weather increases dustiness because dust remains in suspension longer; still, this obvious heavy increase in dust exposure does not retard the normal decline of respiratory illnesses during the summer months.

Charts 5, 6 and 7 show which respiratory illnesses were the more frequent causes of absence and which caused the greatest loss of time. Chart 5 covers the less-than-8-day group. Chart 6 the 8-day-and-over group, and Chart 7 the combination of the two. Influenza, head colds and bronchitis (including chest colds) are the leading causes of absence in the respiratory group.

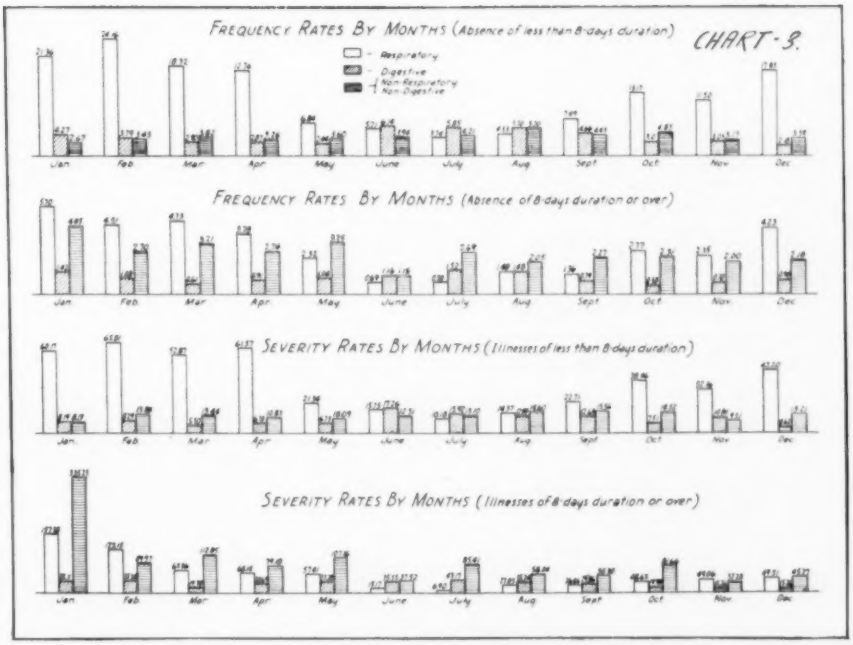


Chart 3. Frequency and severity rates of absences by months shows seasonal variations

Pneumonia provides an interesting picture. The frequency for pneumonia cases, including deaths, was 5.1 per 1000 employes. The severity rate was 103.55 days lost per 1000 employes. Jessamine D. Whitney, statistician of the National Tuberculosis Association, reports that the pneumonia death rate for all gainfully occupied males, based on 1930 census figures, was .69 per 1000 persons. For unskilled workers the death rate was 1.35 per 1000 persons. Among reporting cement plants with a large proportion of unskilled workers, considerable outside work and other pneumonia hazards, the pneumonia death rate was .89 per 1000 employes.

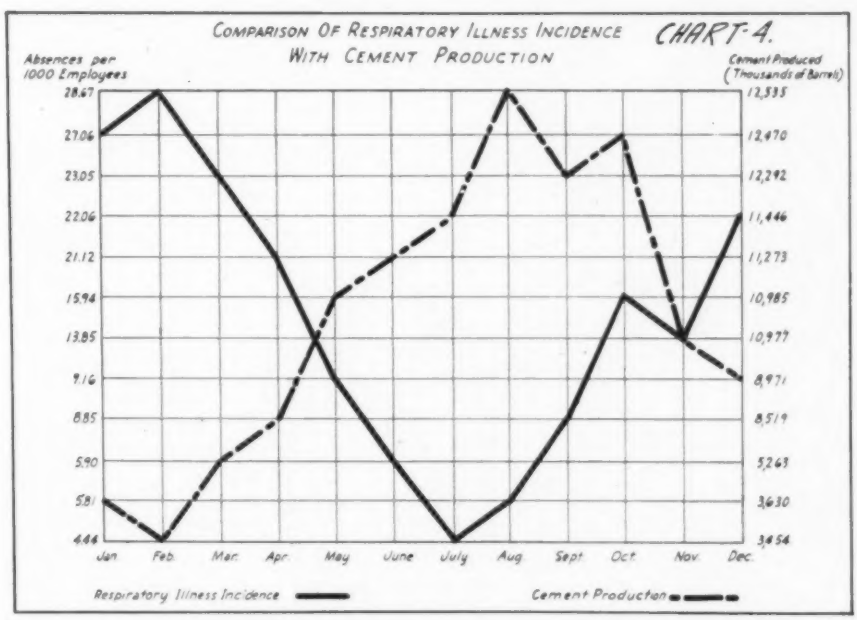


Chart 4. Comparison of respiratory illness incidence with cement production

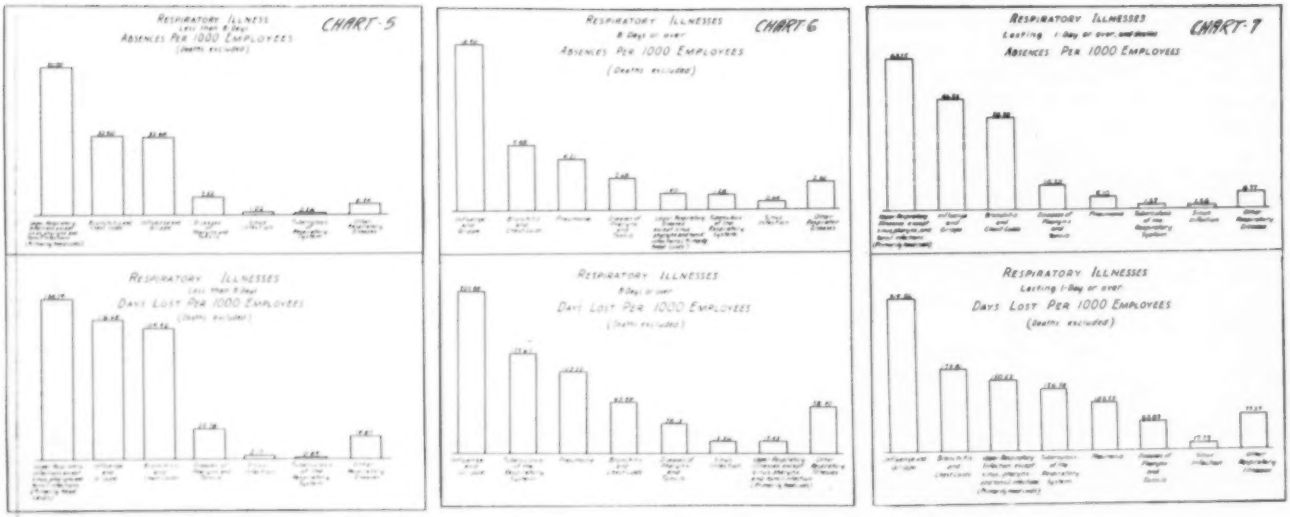
Illnesses of Digestive Tracts

Absence due to digestive illnesses were only about one-third as numerous as those affecting the respiratory system. This proportion is generally considered about average for the population at large. The absence frequency rate for the group studied was 12.62 per 1000 employes for illnesses of over eight days and 46.67 per 1000 employes for illnesses lasting less than eight days. The total frequency rate, including all illnesses of one day or more and the four deaths which were reported was 59.80 per 1000 employes. (See Chart 2)

Of the four deaths reported, three were from appendicitis and one from intestinal rupture. The severity rate for digestive illnesses over eight days was 348.89 and less than eight days, 148.81.

The trend of digestive illnesses by month is opposite that of the respiratory illnesses, there being a noticeably larger amount of digestive sickness during June, July and August than at other times of the year. This is particularly true of minor digestive disturbances.

Miscellaneous illnesses, neither digestive nor respiratory in nature, lasting



Charts 5, 6 and 7 show absences for respiratory illness in periods less than eight days, more than eight days, and one day or over

more than eight days each, disabled 30.86 persons out of every 1000 employes in the reporting plants. Minor illnesses in this classification caused 46.42 out of every 1000 employes to lose time from work. (See Chart 2) Forty-one deaths in reporting plants were attributed to non-digestive, non-respiratory illnesses. This is the equivalent of 5.23 deaths per 1000 employes.

Miscellaneous types of illnesses lasting more than eight days were quite severe, 1017.85 days being lost per 1000 employes on account of these illnesses. On the other hand, minor illnesses of this type rank lowest in severity with a rate of 150.73 per 1000 employes. There is no very sharply defined trend by seasons for miscellaneous illnesses, the largest number of eight-days-or-more absences in this category occurring in January, when the rate was 4.45 for 1000 employes.

Individual Miscellaneous Illnesses

There is no real relationship between the various miscellaneous diseases, as there is between the respiratory diseases or the digestive diseases. Rheumatism is the most important cause of absence in this group.

Skin and cellular tissue diseases (boils, carbuncles, etc.) rank second. Much can be done to reduce the incidence of this disease by education in proper hygienic measures. The fact that skin infections are often included among compensable diseases makes attention to this matter especially important.

Deaths from miscellaneous illnesses show heart disease is the outstanding cause of death.

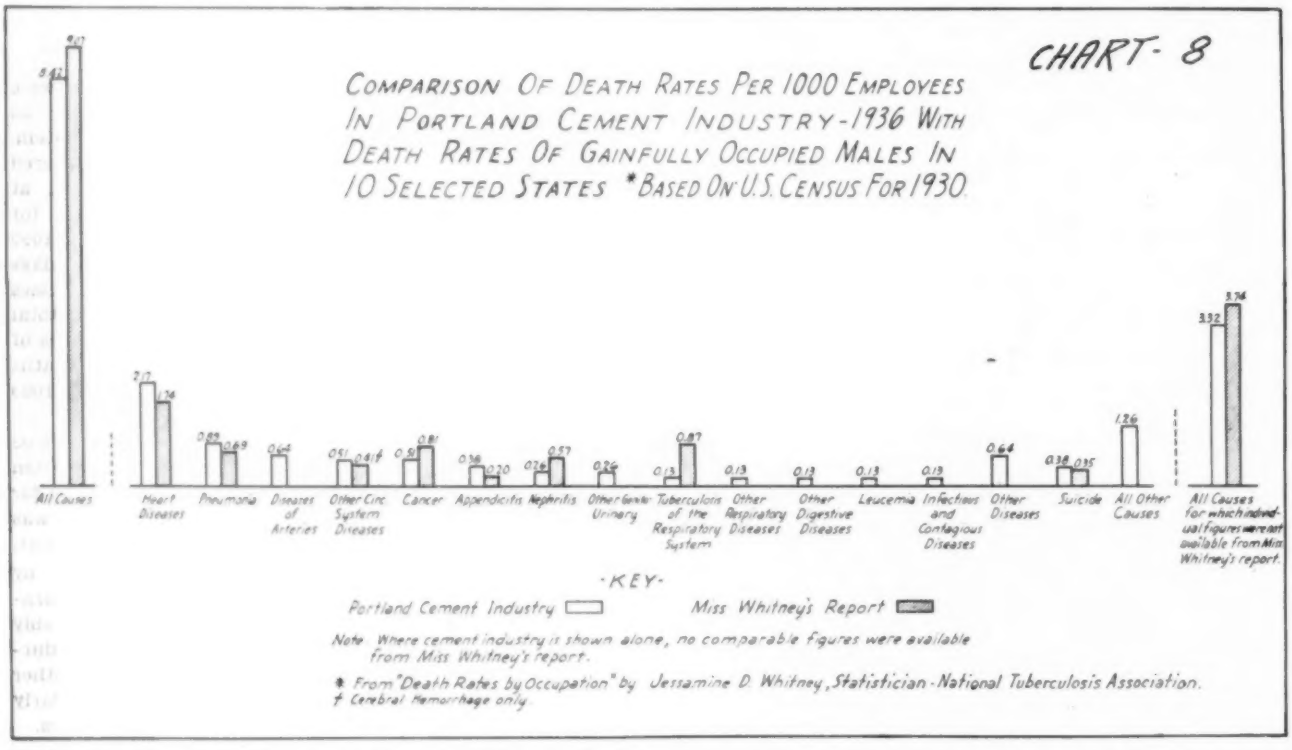


CHART-8
Comparison Of Death Rates Per 1000 Employees In Portland Cement Industry-1936 With Death Rates Of Gainfully Occupied Males In 10 Selected States *Based On U.S. Census For 1930
All Causes
Heart Diseases
Pneumonia
Diseases of Arteries
Other Circ. System Diseases
Cancer
Appendicitis
Nephritis
Other Genito-Urinary
Tuberculosis of the Respiratory System
Other Respiratory Diseases
Other Digestive Diseases
Leucemia
Infectious and Contagious Diseases
Other Diseases
Suicide
All Other Causes
All Causes for which individual figures are not available from Miss Whitney's report
·KEY·
Portland Cement Industry
Miss Whitney's Report
Note Where cement industry is shown alone, no comparable figures were available from Miss Whitney's report.
* From "Death Rates by Occupation" by Jessamine D. Whitney, Statistician-National Tuberculosis Association.
† Cerebral Hemorrhage only.

Chart 8 gives a comparison of death rates per 1000 employes in the cement industry in 1936 with the death rates of industry in general

In 53 plants under consideration, 591 persons were absent eight days or more because of illness. Thus the frequency rate for all illnesses lasting eight days or more was 74.86 per 1000 employes. (See Chart 2) In 1935, the frequency rate for all illnesses of establishments reporting to the U. S. Public Health Service was 73.90 per 1000 employes.

There were 1,832 persons absent less than eight days each on account of illness. This represents a frequency rate of 233.62 per 1000 employes. (See Chart 2) The total number of illnesses lasting one day and over and deaths was 2,477 or 315.86 illnesses per 1000 employes.

A large middle-western manufacturing company which includes office workers and all types of labor from highly specialized mechanical assembling work to heavy manual labor reports a frequency rate for 1936 of 629.90 per 1000 employes. Approximately 10,500 employes are included in this rate. There were slightly half as many illnesses per 1000 employes in the cement industry as in this large manufacturing organization. This wide difference is at least partly accounted for by the fact that the company referred to pays employes for even short periods of illness absence.

A total of 15,607 days were lost because of illnesses lasting eight days or longer, an average of 1,990.17 days lost per 1000 employees. (See Chart 2) Less than eight day illnesses caused a total of 5,557 days lost time, an average of 708.62 days lost per 1000 employes. All illnesses, not including deaths, caused a total loss of 21,164 days, an average of 2,698.79 days lost per 1000 employes.

Comparative Mortality Rates

Chart 8 shows the mortality rate per 1000 employes for all causes: (a) in the portland cement industry in 1936, (b) among gainfully occupied males, in selected occupations in 10 states, based on United States census figures for 1930, as compiled by Miss Jessamine D. Whitney, statistician, National Tuberculosis Association. It is of interest that in only two diseases, heart disease and pneumonia, is the cement industry's rate higher than the rate for all males, and that the tuberculosis rate in the cement industry is ONE-SEVENTH the general rate. Heart and pneumonia rates for cement manufacturing might be more fairly compared with those for other similarly exposed mill operations, were the latter available.

Agricultural Limestone

HOOSAC VALLEY LIME CO., North Adams, Mass., has installed new machinery to make pulverized limestone for agricultural purposes.

To Foreign Shores

W. CHRIS THIEL, for the past 3½ years assistant superintendent and engineer of the Southern States Portland Cement Co., Rockmart, Ga., is now in a similar position with the Lone Star Cement Corp's Brazilian plant at Rio de Janeiro. He was formerly with the Lone Star organization, for a time at its Cuban plant.

• • •

S. G. MCANALLY, recently chief chemist of the giant Portland Cement Co., Egypt, Penn., left New York City, September 11, for Sao Paulo, Brazil,

S. G. McAnally

where he will become general superintendent of the Brazilian Portland Cement Co. Mr. McAnally came to the cement industry several years ago from the far west gypsum industry, and will be remembered as a contributor to ROCK PRODUCTS on both cement and gypsum over a period of many years.

Overwork Disability!

DISTRICT OF COLUMBIA COURT OF APPEALS recently ruled that overwork is a valid reason to be given by an employe in claiming disability allowance for workmen's compensation. The case was brought by James Rennie, Baltimore insurance adjuster, who alleged that over-work induced a heart attack which resulted in permanent disability. Rennie contended that he handled 250 to 300 cases per day, whereas the usual number handled by fellow employes was 75 to 100 per day. This pressure of work, he declared, aggravated a heart condition which was climaxed with an attack on May 5, 1934. Rennie's employer, the Royal Indemnity Co., and another insurance company, the Globe Indemnity Co., sought an injunction to restrain the U. S. Employes Compensation Commission from making a compensation award to Rennie. The Federal District Court upheld the contention but the Appeals Court reversed the ruling.

August Statistics

PORTLAND CEMENT INDUSTRY in August, 1937, produced 11,894,000 bbl., shipped 12,291,000, and had in stock at the end of the month 22,973,000, according to the Bureau of Mines. Production and shipments in August showed decreases of 5.6 and 2.6 percent, respectively, as compared with August, 1936. Stocks at mills were 21.4 percent higher than a year ago.

The statistics here given are compiled from reports for August, received by the Bureau of Mines, from all manufacturing plants.

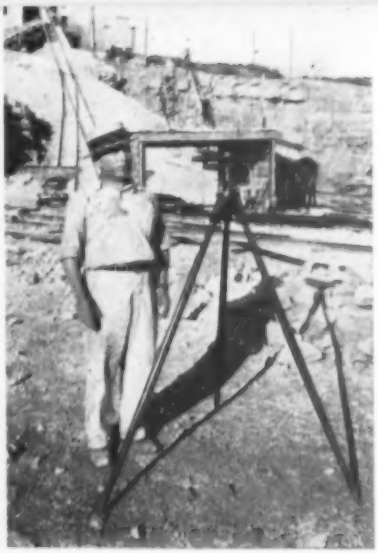
In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 160 plants at the close of August, 1936 and 1937.

	August		July	June	May
	1936	1937	1937	1937	1937
The month...	56.2	54.4	53.1	52.8	53.2
The 12 months ended.....	36.1	47.6	47.8	47.8	47.9

UNIVERSAL ATLAS CEMENT CO.'S, Chicago, Ill., two veterans in the cement industry, with total service records of more than 75 years, were honored this week when 35 business associates of J. A. Ahnfelt and A. G. Carlson, retiring operating manager and chief engineer, respectively, tendered them a farewell luncheon at the Union League club, Chicago. Mr. Ahnfelt has been with the company for 42 years and Mr. Carlson 34 years.

P. C. Van Zandt, vice-president of Universal Atlas, presided and talks were made by B. F. Affleck, former president of the company, O. N. Lindahl, comptroller and E. D. Barry, manager of industrial relations. Numerous telegrams from plants and offices of the cement company were read felicitating Messrs. Ahnfelt and Carlson on their records and extending good wishes for the future.

REPUBLIC PORTLAND CEMENT CO., San Antonio, Tex., stockholders voted August 30 to change the name to Longhorn Portland Cement Co., Longhorn, being the established brand name.



M. S. Price, vice president in charge of improvements, who, it will be noted, is not a swivel chair executive

Gibsonburg Lime Products Co.

Increases Capacity 65%

By Adding Five New Kilns

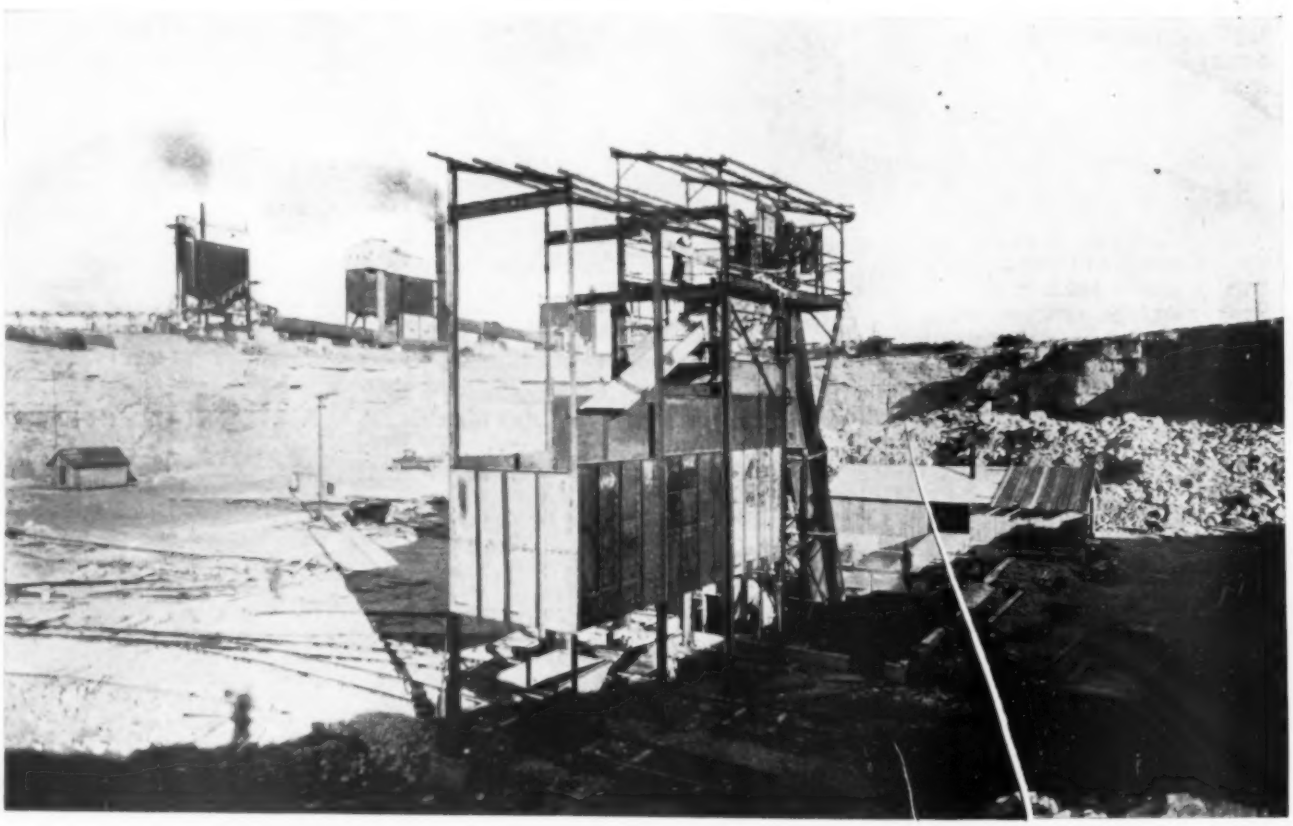
and Improving Quarry

MANY IMPORTANT IMPROVEMENTS have been made during the past two years at the plant of the Gibsonburg Lime Products Co., Gibsonburg, Ohio, climaxed this year by increasing the capacity of burned lime from 100 tons in 24 hr. to 165 tons, construction of a new crushed stone plant on the quarry floor, and the installation of Diesel power to take the place of previously purchased electric power.

The original lime plant built in 1927 was designed and laid out so that some of the expansion, now completed, could readily be installed. Much of the original equipment serving the new machinery was designed to accommodate the additional demands now placed upon them.

Quite an extensive quarry has been developed since stone was first taken out; the plant and quarry operating methods having been described at that time in the September 3, 1927 issue of ROCK PRODUCTS. The new stone plant just completed in the quarry serves a threefold purpose; to set a minimum size for kiln stone; to size commercial stone; and to furnish the stone demands for a burned-dolomite plant adjoining.

Before installation of the crushing and screening plant, there was no defi-



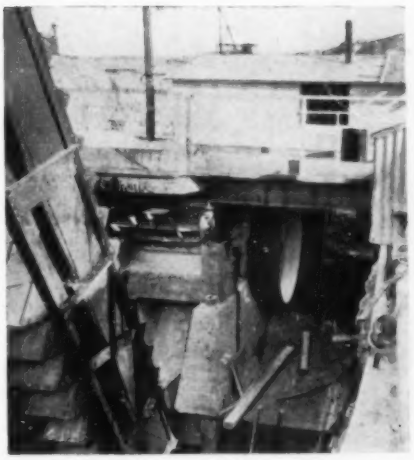
Crushing plant and screening facilities with Diesel power house in background

nite control of kiln stone size, while commercial stone was hauled in quarry cars out of the quarry to a temporary screening plant. Kiln stone was all hand-picked at this time and car loaders were paid on a piece-work basis.

Primary Crusher Below Quarry Floor

Present workings are on a second level on a 45-ft. face. The new all-steel stone crushing plant is located centrally on the level quarry floor with a primary crusher set 20 ft. below the floor so that trucks can dump rock directly into the crusher without negotiating an incline.

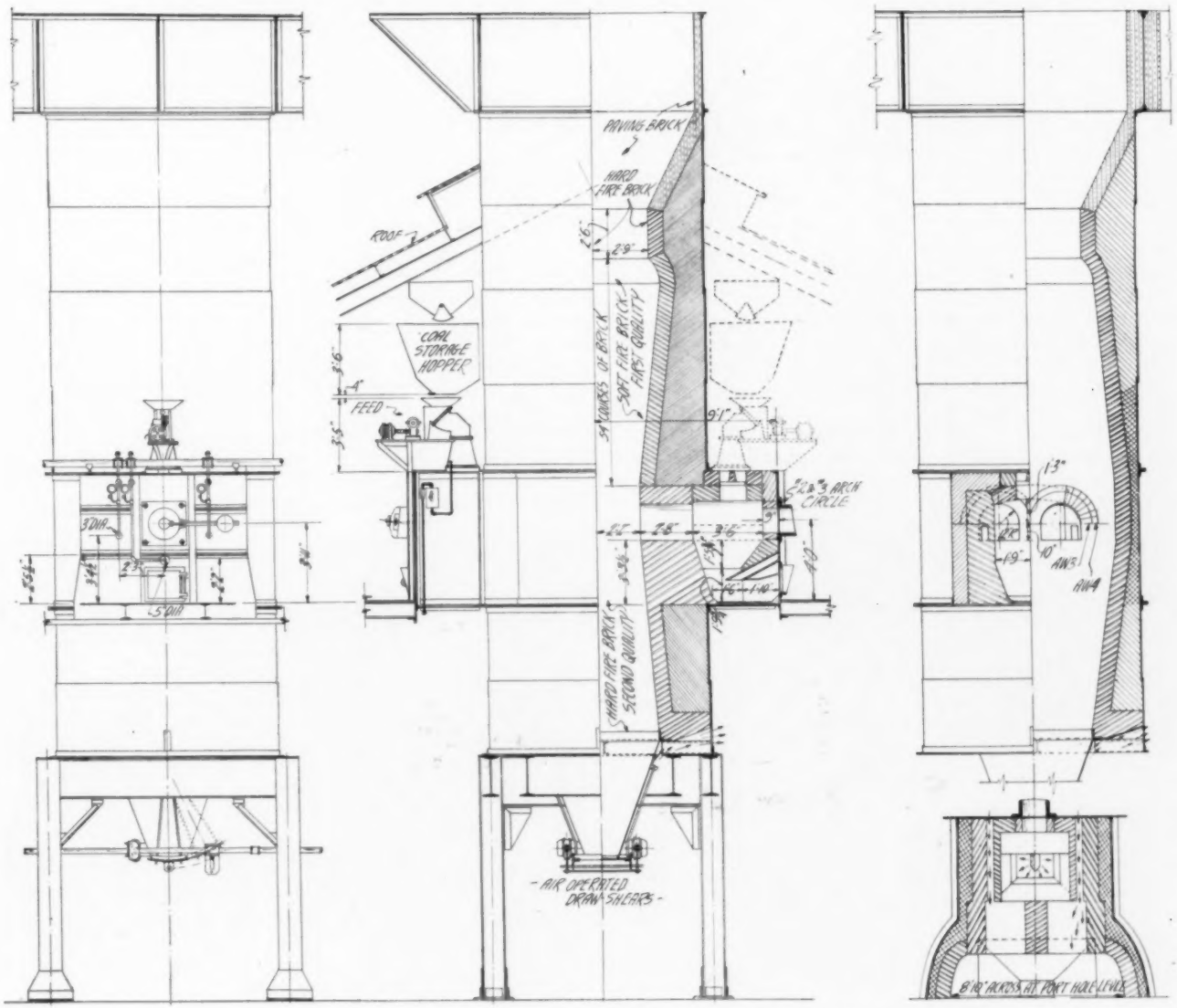
A Marion electric shovel loads about five tons of stone into each of four quarry trucks (two White trucks and two Internationals), which discharge directly into a McLanahan and Stone 24-x48-in. single-roll crusher, which reduces all stone to nine inches and under. Two extra trucks, a Relay and an International, also are available when needed. The crusher discharge is elevated by a Jeffrey chain bucket elevator, 63-ft. centers, to the sizing screen. After sizing, the kiln stone goes over a picking belt. Here, a single man can do the picking which before the crushing plant was installed, took considerable time and the labor of 24 men to hand-load quarry cars.



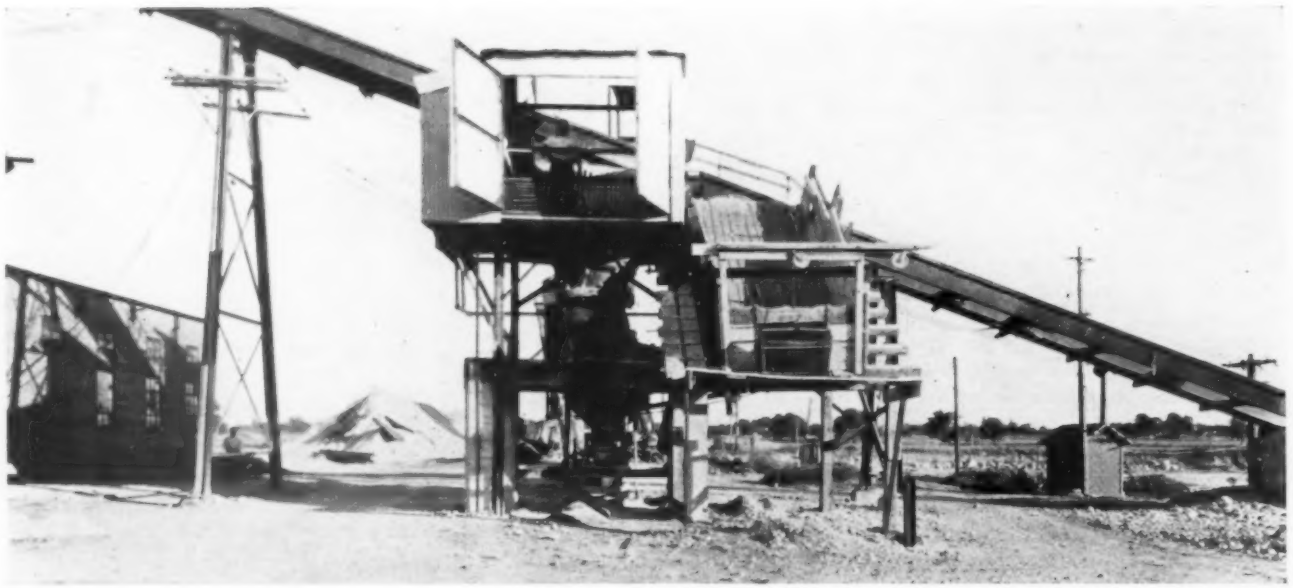
Close-up of primary crusher

Stone is sized over a Tyler "Tyroc" 4-x10-ft. double-deck screen mounted in live rubber. Screen openings are 4½-in. on the top deck with 3-in. and ¾-in. on the bottom deck. The oversize, kiln stone, goes direct to a 60-ton bin. Stone retained on the lower deck is sold for the manufacture of sintered dolomite to a concern whose plant is adjacent to the company's quarry. This stone is stored in an 80-ton bin. The throughs, or commercial stone, go to a 60-ton bin.

Stone from either bin may be loaded



Sectional view of kiln showing location of coal storage hopper and electric driven coal feeder



Incline from quarry on which cars of stone are carried to lime kilns. Note by-pass for transferring stone to secondary crusher and also truck loading chute

out to Koppel 3-yd., side-dump, quarry cars traveling on 3-ft. gauge track under the bins. Cars are pulled up the incline and over the kilns by a Lidgerwood single-drum hoist. Commercial stone can either be hauled out of the quarry by trucks or be taken direct from the lime kiln incline on the ground above.

From the incline, stone may go direct to the kilns or be chuted to trucks for commercial purposes, or it may be bypassed to another belt conveyor loading the bins of a plant nearby, producing sintered dolomite. Stone is discharged from the cars by a man stationed on the incline above the point of transfer to the conveyor carrying stone to the dolomite plant bins. Stone for that purpose is either passed through a McCully No. 5 crusher or by-passed according to demand.

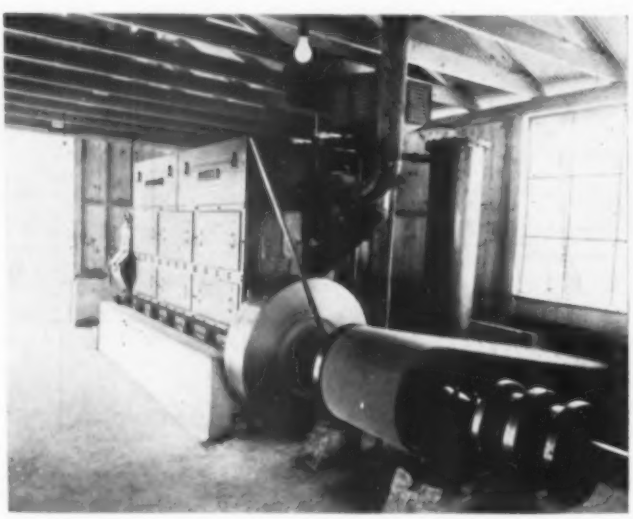
Power from Diesel-Generator Set

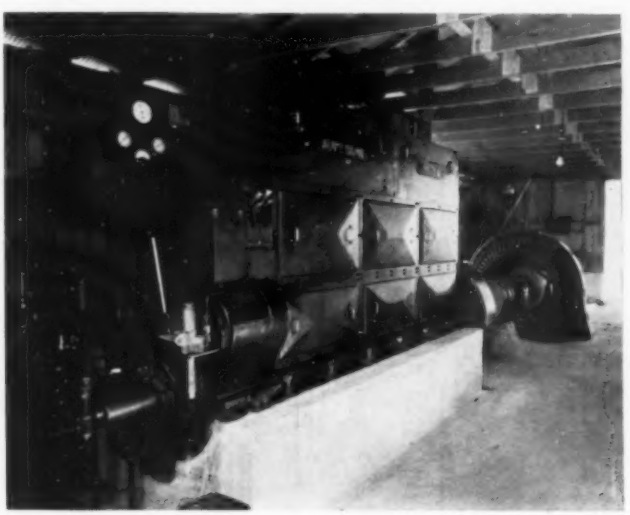
All electric power was purchased until this year, when a Diesel-generator set was installed in the quarry in a new 20-x40-ft. powerhouse. The Diesel engine is a National Superior constant pressure, solid injection type, with a 9-in. bore and a 12-in. stroke, and is direct-connected to an Allis-Chalmers 196 kw. generator through a Dodge clutch. Excitation is provided by a 5 kw. Allis-Chalmers exciter.

The power plant furnishes electrical power to drive motors in the lime and stone plants at night, when the electric shovel is not in operation. When the quarry is in operation, sufficient current is generated to operate the shovel, the crushing and screening plant, the pumps, the air compressor and secondary crusher. The primary crusher is driven directly off the engine shaft and controlled by means of the Dodge clutch. Footings and space have been provided in the powerhouse for installation of another similar power unit.

The engine is started by an air pressure of 150 to 240 p.s.i. Instead of the usual water cooling tower, the engine is equipped with a Sims heat exchanger.

Cooling water is pumped from the quarry by a Deming deep well rotary pump. All quarry seepage drains to the primary crusher pit from which the water in turn flows to a deep well. When the Diesel engine is in operation





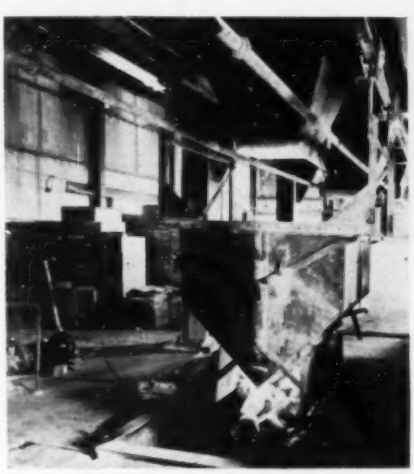
Left—Diesel engine direct-connected to electric generator. Note belt drive to operate primary crusher. Right—Full view of Diesel engine and shaft connecting with electric generator

Battery of thirteen shaft kilns fired by electric coal feeders

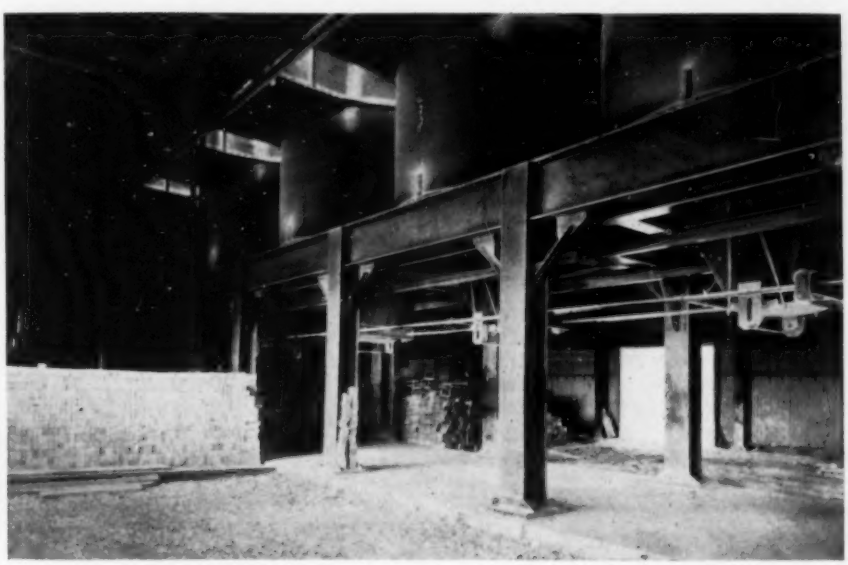
this quarry drainage is pumped into the heat exchanger at the rate of 75 g.p.m. When the Diesel engine is idle, drainage water is pumped out of the quarry. The peak load carried on the power unit is 240 hp. Soft water is brought to the plant in barrels.

The original lime plant was designed by Arnold & Weigel, Inc., Woodville, Ohio, designers and builders of lime plants. This plant had a daily capacity of 100 tons of burned lime with eight standard Arnold kilns, 11-ft. in diameter and 50 ft. high. To increase the daily plant capacity to 165 tons of lime, the same firm designed and installed five new kilns early in 1937, similar in design and identical in dimensions.

Each of the kilns is fired externally with an Arnold & Weigel "Ward" electric driven coal feeder for each of the two fireboxes on each kiln. The coal feeders automatically regulate the feed of coal into the kilns. Excess air is largely omitted from the kilns inasmuch as the poke doors are only opened at drawing periods. Much of the coal is ignited in the air, and lime is burned at 2000 deg. F. All kilns are insulated completely with Harbison-Walker insulation brick. The original 100 hp. Brownell boiler with Worthington feed water pumps furnishes the needed steam for the operation of 13 kilns. Coal, $\frac{3}{8}$-x1$\frac{1}{2}$-in. in size, is fed to the coal feeders by a 1-ton steel bucket, traveling on an overhead monorail manufactured by the



Hopper bottom steel car operating on trolley discharges lime from kiln into pan conveyor



Looking down battery of kilns from drawing floor below firing floor

Louden Machinery Co., Fairfield, Iowa. Each coal feeder has a capacity of one ton. The monorail has been lengthened to serve the added five kilns, and the 36-in. gauge track from the quarry likewise has been extended over the new kilns.

Drawing of lime every four hours from each kiln is accomplished by means of a pneumatically operated draw shears. Lime from the coolers is carried in a hopper-bottom steel car, traveling on a Louden double-track overhead trolley, discharging to a slow-moving pan conveyor. Here, deleterious material is removed, and the lime discharges to a Sturtevant No. 2 gyratory crusher for reduction to ½-in. in preparation for hydration.

Over 95 percent of the lime output is hydrated. The majority of the quicklime is elevated to a 600-ton sealed bin, but quicklime for glass house lime or for sale to the steel trade is by-passed the storage bin to a Williams 20-x24-in. hammer mill closed-circuited with a Tyler 4-x5-ft. Hum-mer screen. This installation was made two years ago.

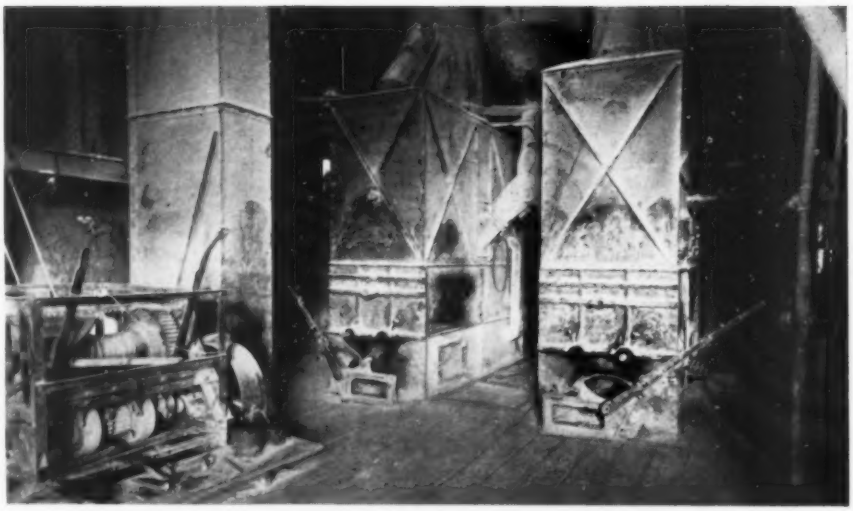
Lime to be hydrated is drawn from the storage bin to an elevator feeding a 1-ton hopper above the two standard size Weber hydrators of Arnold & Weigel manufacture. A second 1-ton batch hydrator was installed this year when the quicklime capacity was increased. Lime is fed into the hydrators by screw conveyors. The lime is kept in constant agitation inside the hydrators and water is applied by sprays from pipes within. From four to five batches of hydrate are made per hour. From the hydrators, screw conveyors and elevators either transport the hydrate to a grinding mill or to the ageing bins of 800-ton capacity.

Finishing lime is pulverized in either a Bonnot mill (installed two years ago) or a Raymond No. 3 pulverizer and air separator. The fine product is then placed in the bagging bins. Another Bonnot mill is now being installed.

The lime kiln building addition is of structural steel with corrugated roofing and sides. Steel work was furnished by the Pittsburgh-Des Moines Steel Co., Pittsburgh, Penn., and the erecting was done by Monette Bros., Pittsburgh, Penn. All siding is an Armco product.

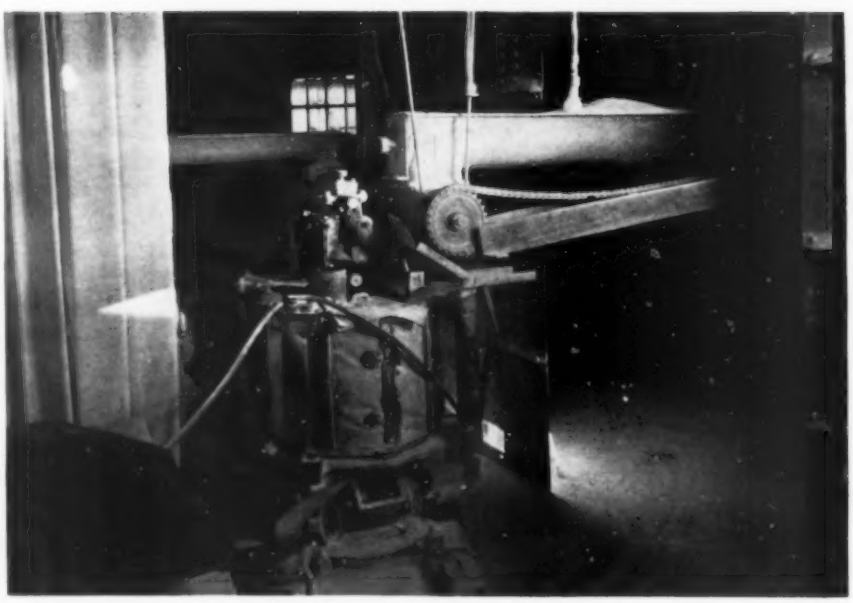
To increase the packing-out capacity to 250 tons of lime daily, a warehouse was built about two years ago and a 125-ton finishing lime bin was installed in addition to two Bates, 4-spout baggers.

Officers of the company, are W. H. Price, President; S. G. Price, vice-president in charge of production; W. M. Barbee, treasurer; and G. H. Faist, secretary.

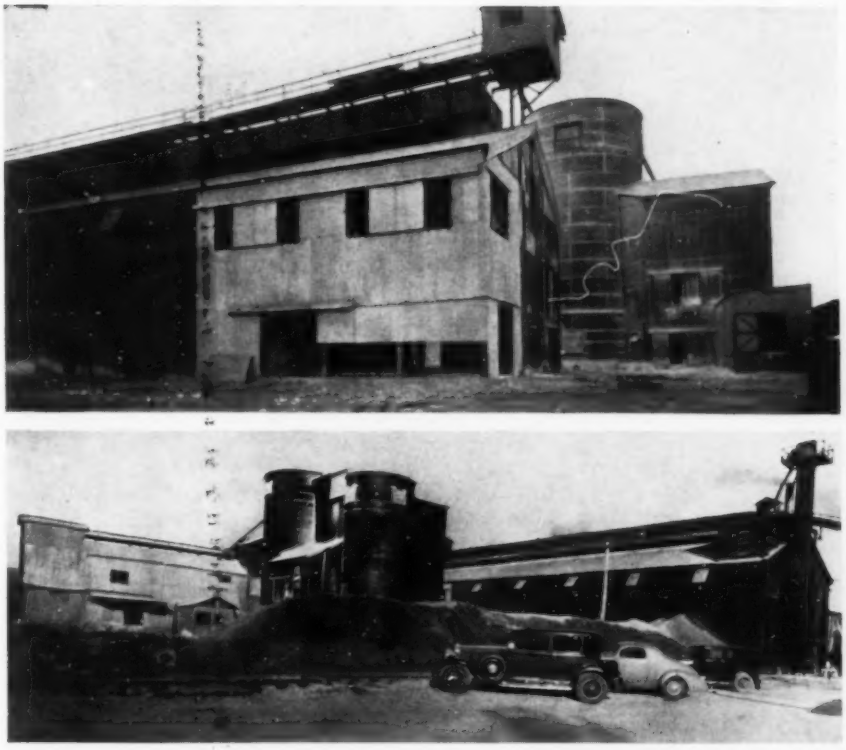


Two hydrators with the new unit on the left

Hammer mill for making intermediate quick lime products



Mill for pulverizing finishing lime



Above—Exterior of building housing kilns, showing new addition. Below—Lime storage silos

Stone Production Up

With an increase of 57 percent in quantity and an increase of 61 percent in value, the final 1936 figures for the entire stone industry compared with 1935 show remarkable progress. The Bureau of Mines reports total 1936 stone production as 130,758,420 short tons valued at $141,103,979.

Crushed and broken stone, which amounts to about 99 percent of the total output, amounted to 128,952,800 tons valued at $117,374,293, an increase of 58 percent in quantity and 62 percent in value. Crushed stone aggregates for concrete and road material and railroad ballast amounted to 86,779,820 tons valued at $81,837,787, an increase of 58 percent in quantity and 67 percent in value.

Commercial plants produced 49,112,350 tons of concrete and road aggregates valued at $47,410,574, an increase of 50 percent in quantity and 56 percent in value. In 1936, 57 percent of the commercial output was transported by truck, 7 percent by water, and 6 percent unspecified as to transportation. Operators of non-commercial plants for concrete and road aggregates produced 29,776,390 tons of stone valued at $28,434,520, an increase of 79 percent in quantity and 96 percent in value. All of this material was transported by truck.

In 1936, commercial plants furnished 66 percent of the total aggregates, non-commercial plants, 34. In 1935, these figures were 70 and 30 percent, respectively. The average value per ton in 1936 of commercial stone was 97 cents against 90 cents in 1935; non-commercial stone, 96 cents compared with 87 cents in 1935.

Of the other crushed stone products, stone for metallurgy (17,724,880 tons valued at $11,576,156) increased 45 percent in quantity; agricultural limestone (3,473,710 tons valued at $4,406,603) increased 75 percent; refractory stone (1,324,040 tons valued at $1,831,693) increased 53 percent.

Turn Down Union

McGrath Sand and Gravel Co., Lincoln, Ill., operating plants at Pekin and Chillicothe, Ill., has had labor elections at the two latter plants, according to local newspapers. The employes voted against joining a labor organization when union representatives from Peoria sought to organize the Pekin and Chillicothe plants. The workers said they were content with their wages and hours. The Pekin plant, which has been idle for the last two weeks, has resumed operations, all the men returning to their jobs, according to Robert Ashley, superintendent.

Glass Sand

R. W. Stone, Pennsylvania Geological Survey, states in a paper on "Pennsylvania Glass Sand Industry in 1936," before the American Ceramic Society:

"Illinois ranks first in the quantity of glass sand marketed. Pennsylvania and West Virginia are rivals for second place. In three recent years (1932 to 1934), West Virginia produced 1,088,000 tons and Pennsylvania 1,061,000 tons, a difference of only 27,000 tons in West Virginia's favor. Illinois' lead in those three years was less than 100,000 tons. This lead is in tonnage, not in value, for in four years the value of Illinois glass sand sold was $1,750,000 dollars as against $2,635,000 for Pennsylvania's output. The average price of Illinois glass sand is about $1.00 to $1.18 per ton and that of Pennsylvania sand from $1.70 to $2.00.

"As for quality, the Homewood sand, produced by the Dunbar Corp. for amber glass, carries 99.35 percent silica and 0.25 percent iron oxide, and the Oriskany sand of the Pennsylvania Glass Sand Corp. is 99.82 percent silica and 0.014 percent iron oxide. Some analyses by this company have shown 99.99 percent silica. The iron oxide content of Pennsylvania's highest grade dry glass sand, 0.014 percent, is very low in comparison with the 0.09 to 0.5 percent in white St. Peters sandstone from Illinois."

Ground Feldspar

Tri-State Development Co., Bowditch, N. C., is building a plant adjacent to the Feldspar Milling Corp. to make a cleanser using ground mica as a base.

Vermiculite Deposit

E. H. Paine, Casper, Wyo., is reported to have discovered a commercial deposit of vermiculite on his property near Encampment, Wyo., and to be planning erection of a small plant to quarry and crush it. The only other deposits known are in Montana, Colorado and North Carolina. Vermiculite is a species of mica which upon heating expands in very light weight fluffy particles (Zonolite is a trade name for the calcined product) much used for insulation and as a lightweight aggregate for plaster, etc.

Tax Diversion Penalty

New Jersey has lost $250,000 federal aid money for the fiscal year ended June 30, 1937, because of excessive diversion of the state's road funds to non-highway purposes.

Pump for transferring aged lime putty to batcher

New York City Now Has

LIME PUTTY PLANT

at Colonial Sand and Stone Co. Yard

AGED LIME PUTTY and ready-mixed mortar made by the Brooks-Taylor process have been made available to contractors and builders in the New York metropolitan area this year by the Colonial Sand and Stone Co., Inc., large producers of sand and gravel, from the company's Astoria, N. Y. yard.

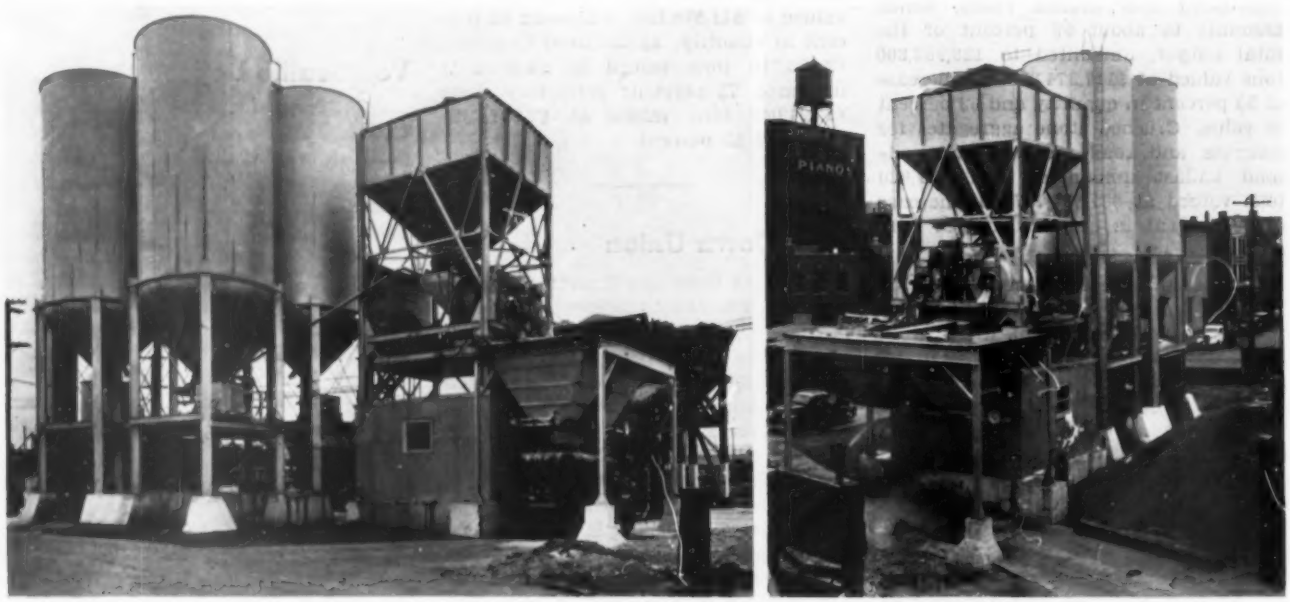
This is the largest standard plant yet installed for the manufacture of lime putty by this process. The plant was placed in operation in July to prepare lime putty and arrange for its distribution and to mix proportioned mortar (lime and sand only) if the contractor prefers a ready-mixed product to mixing it on the job. The portland cement requirement is added at the job.

The putty plant is a complete unit with four ageing tanks of 20,000 cu. ft. total capacity. This installation is of particular interest on account of the size of the plant and the method of proportioning and mixing mortar, although the process is the same as in other plants recently described in ROCK PRODUCTS.

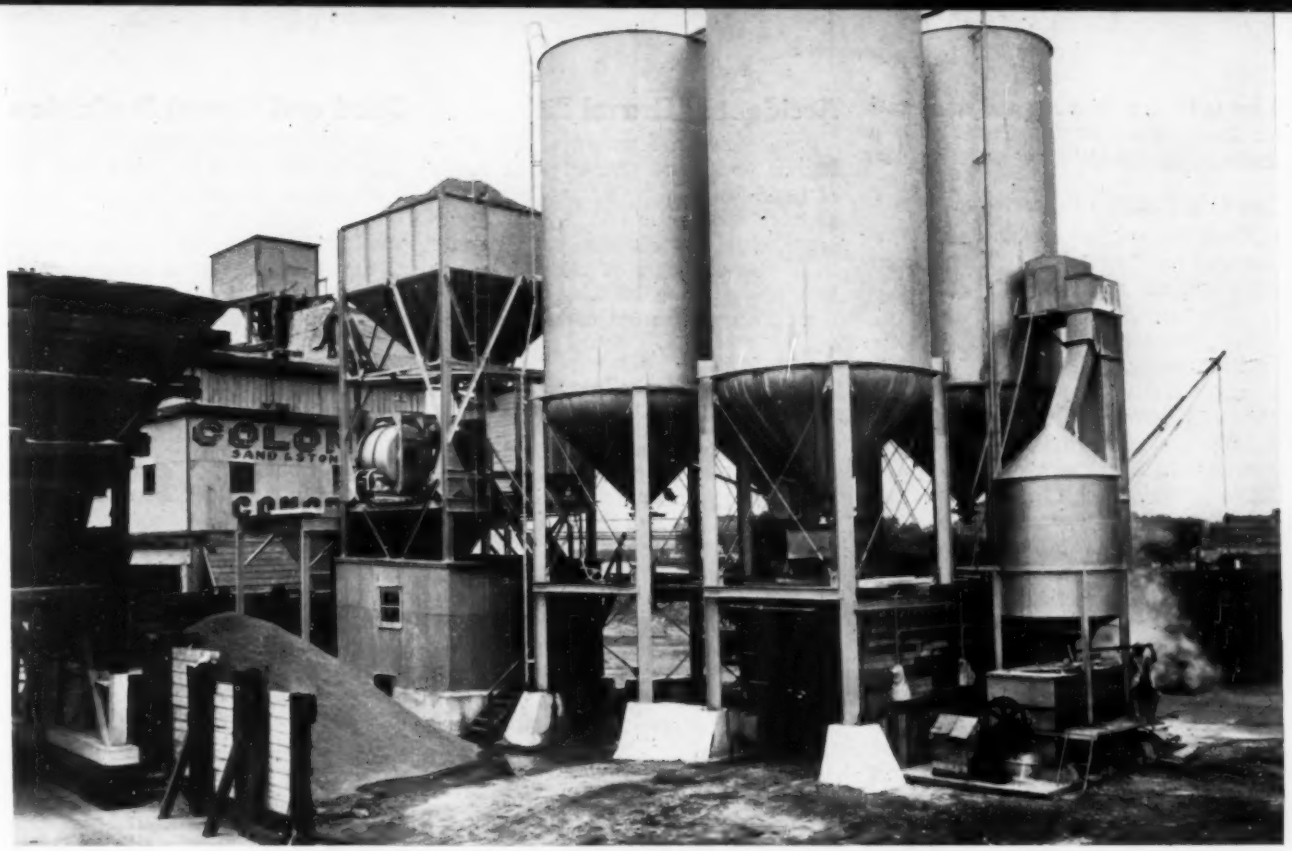
Lime from New England (high calcium) made in rotary kilns is brought in by trucks which unload into a hopper, feeding the boot of an enclosed elevator. From the elevator, the lime is discharged into a 20-ton bin. The lime is drawn from this tank through a hand-operated gate into an open-top pug-mill type slaking machine where the lime is continuously agitated during hydration.

About 2500 lb. of quicklime is slaked in each batch. A recording thermometer is provided to control slaking temperature and is instrumental in checking the burning or "drowning" of the lime. After slaking is finished, it is passed over a single-deck vibrating screen for the purpose of removing lumpy material and any unslaked lime, and is then pumped by a "Humdinger" pump to any one of the four seasoning or aging tanks through a 4-in. pipe line.

Instead of having one central filter for all four tanks, each tank is equipped with four 12-in. octagonal, vertical filters spaced equally in the horizontal cross-section of the tank for the removal of excess water. The large size of the tanks necessitated the use of a filter for each tank to provide sufficient filtering capacity. Water is filtered off while the tanks are being filled and continues after filling, until putty of the desired moisture content is reached. The valve at the bottom of each vertical



LEFT: Truck with six 1 yd. compartments being loaded from batchers. Four ageing tanks to the left. RIGHT: View showing mortar mixers



Lime putty plant with mortar mixing plant to the left, below sand bin, and lime slaker to the right

filter is then closed and ageing begins. Each filter is made of a double thickness of galvanized screen wire, coarse sand filling the volume between the vertical pipe and the octagonal outer screen shell. The coarsest sand which will not allow passage of the lime putty into the excess water discharge pipe is used. This sand is slightly finer than "grit" size.

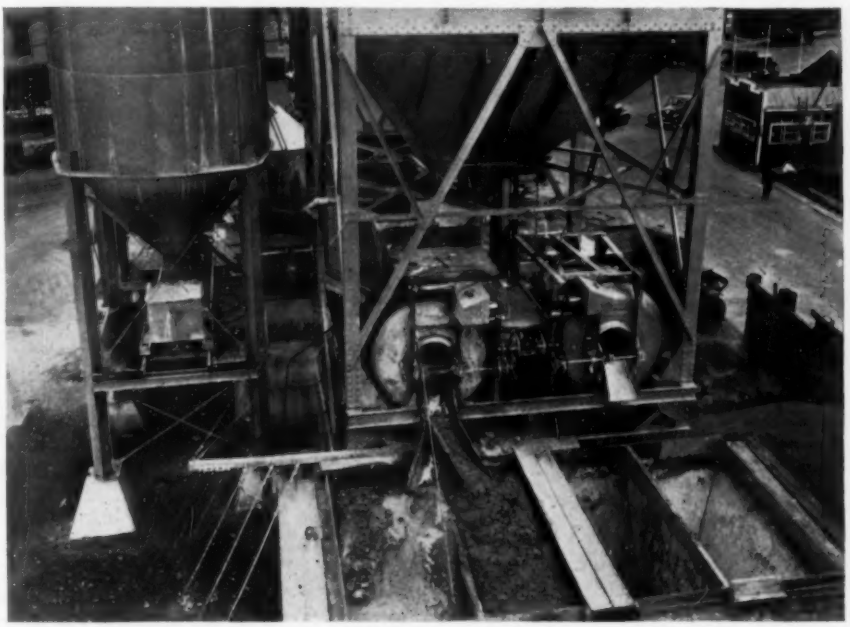
Lime putty is aged from 10 to 14 days in each tank before it is ready for shipment. To help discharge the putty from each tank, an agitator on a horizontal shaft extending through the conical bottom of each tank, near its discharge, may be operated by a handle adjacent to the release valve.

Accurate Proportioning

Equipment has been installed to accurately batch and mix sand with the lime putty when mortar is ordered, but the plant is so equipped that deliveries of aged lime putty alone may be delivered to the job. For such shipments, lime putty is drawn through special water-tight valves into either of two movable weighing batchers below. One of these batchers serves either of two tanks, and is readily moved from one tank to the other on rails. Trucks pass below the measuring batcher, receive their load of lime putty and pass through to the job, without any backing-up at the plant. At present, Ford trucks with six 1-yd. compartments are used to haul lime putty.

Adjacent to the lime putty plant has been built the mortar batching and mixing floor, completely equipped for accurate handling of materials. A 110 cu. yd. steel hopper for sand has been erected, from which Cow Boy sand is batched in a 1-cu. yd. batch hopper and chuted to either of two 1-yd Koehring mixers.

Lime putty to be mixed into mortar is drawn from either ageing tank through an outlet near its bottom and pumped by a 12-in. specially constructed "Humdinger" pump (Frank B. Carter Co., Harrison, N. J.), centrally located with respect to all four ageing tanks, to a batch hopper above the mixers. The reason for using a pump feed to the mixers instead of a gravity feed from the tanks is because it is neces-



Mortar mixers discharging into a four compartment bin, each compartment holding 8 yd.

sary to have a constant and rapid rate of feed, under varying heads with a material of the viscosity of lime putty.

Loading Facilities

From the mixers, the mortar is discharged to either of four loading hoppers of 8-cu. yd. capacity each. When smaller quantities are to be loaded into trucks, the mortar is batched out directly from the mixer. If, for example, a contractor requires one, two or three yards of mortar, one, two or three batches are made in the mixer as the one-yard batches are very accurate in finished mixed mortar. The mortar plant has a capacity of 500- to 600-cu. yd. of mortar in an 8-hr. day. Trucks are filled with mortar with a minimum of delay and no time is lost for batching. Whatever mix is specified, the plant is prepared to fill it. If cement is specified, it also may be mixed at the plant. Mortar deliveries are made in trucks equipped with open-top, 8-cu. yd. V-shaped bodies. A screw conveyor at the bottom of the body, driven from the truck power take-off, is used to unload the mortar at the job. Twelve of these trucks are in service, and more will be added if necessary. Shipments from this plant will be made within a radius of 15 miles.

The character of jobs served covers everything from the Radio City group to small home jobs in Queens Borough and other outlying sections—jobs where the highest quality, made with the utmost efficiency, is delivered to jobs demanding the most economical product possible under the city ordinances.

The Colonial Sand & Stone Co. has been in existence for about 20 years. Its president is Generoso Pope, who has been a dominant figure in the industry in New York City for many years. Durando Miller, vice-president of the company, will be remembered as the proprietor of the former Blue Diamond Co., of New York, which made lime mortar and putty under the Hay "Blue Diamond" process.

Plant Addition

JAEGER SAND & GRAVEL CO., Milwaukee, Wis., has obtained a permit for a $7500 addition to its plant on W. Schlinger Avenue in the town of Wauwatosa. Five new steel hoppers and a conveyor system will be added.

Gravel Pits Change Owner

ENERGY SUPPLY CO., at Keener near Popular Bluffs, Mo., has sold its gravel pits and equipment to G. C. Hill of Dexter.

Accident in Gravel Pit

ALVA PADGETT, foreman of the Blue Rapids Sand and Gravel plant south of Sand Springs, Kan., was injured in an accident at the gravel pit. A pole broke, striking Padgett across the back as it fell, resulting in injuries to the back and a severe cut across one ankle. His condition was not considered serious.

Organize New Company

NEGLEY SAND CO., East Liverpool, Ohio, has been organized by Albert E. Frosch and W. H. Vodrey of this city. A new sand and gravel plant costing $50,000 is to be built which will have a capacity of 100 tons an hour. It will comprise a steel superstructure with a concrete base, and will be 300 ft. long and 45 ft. high. The first floor will contain crushing and screening equipment, while the second and third floors will be used for storage bins. Material will be graded into six standard sizes, three of gravel and three of sand. An electric power plant will be constructed to operate the machinery. Albert E. Frosch, head of the Eastern Ohio Sand and Supply Co., East Liverpool, one of the owners of the Negley company, will act as general manager, and continue, temporarily at least, his connection with the Eastern Ohio company. The site of the new plant is at the juncture of the Pittsburgh Coal Company's short line railroad from Smiths Ferry, Penn., with the P. L. and W. at Negley, and the source of supply will be a natural deposit in the fork of the Beaver Creek and Bull Creek.

May Suspend Gravel Job

BACKSTROM AND MIDNES, Zumbrota, Minn., gravel pit operators, may indefinitely suspend work on their $33,500 county gravel contract if a satisfactory solution cannot be found to settle labor difficulties which have closed the plant.

Open New Gravel Plant

LEO S. ROSS CONSTRUCTION CO., Yakima, Wash., has started operations in its new sand and gravel plant located in the Moxee district. According to H. O. Whited, superintendent, it is expected the plant will be in operation for some time supplying material to H. J. Adler & Son, contractor, for a canal being built in the Terrace Heights district. Seven men operate the plant which keeps four truck drivers busy. The plant has a capacity of 500 yd. of sand and gravel daily. Shops have been constructed in connection with the plant, and a pump has been installed to provide water for washing the material.

Sand and Gravel Production

Final figures on sand and gravel production and value for 1936 have just been made available by the United States Bureau of Mines, Department of the Interior. The tonnage exceeds that of any other product of mine or quarry except coal, and the number of men employed is greater than for any of the metal mining industries with the exception of iron and copper. The general public little appreciates the economic importance of the sand and gravel industry as it is not surrounded by the glamour associated with metal mining, but the statistics reveal an interesting story.

In 1936, the total quantity of sand and gravel produced in the United States was 178,329,814 short tons valued at $90,307,752. About one-third of the sand and gravel produced in the United States last year was taken out by construction or highway maintenance crews employed by state, county or municipal governments.

Sales by commercial operations, amounting to 119,920,395 tons valued at $72,232,391, represented approximately 67 per cent of the total output, an increase of 42 percent in tonnage over 1935 but a drop from 61 cents a ton in 1935 to 60 cents in 1936. Increased construction activity was reflected in the output of building sand which amounted to 27,722,960 tons, a gain of 73 per cent over 1935. Production of structural gravel increased to 25,850,985 tons.

Washed or screened material represented 104,232,588 tons out of the total commercial production, and the average value was 64 cents a ton. Companies reporting on the method of transportation employed show that 51 percent of the 104,000,000 tons reported was shipped by rail, 37 percent by truck, and 12 percent by water.

Production by noncommercial operations in 1936 amounted to 58,409,419 tons with an average value of 31 cents a ton, an increase of 49 percent in tonnage from 1935. Only 20 percent of this material was washed, screened, or otherwise prepared to make it comparable to the output of the average commercial plant. Of the total noncommercial production, 31,206,204 tons, valued at 23 cents a ton, was produced directly by construction or maintenance crews of states, counties, municipalities, and other government agencies, while 27,203,215 tons, valued at 40 cents a ton, was produced by contractors expressly for the use of such agencies. State highway departments accounted for 56 per cent of the total output; counties, 36 per cent; municipalities, four percent; and others four percent.

Cincinnati Lime Putty Plant Has Norman G. Hough

RICHTER CONCRETE CORP., Cincinnati, Ohio, ready-mixed concrete producers, have completed and placed in operation a new Brooks-Taylor process lime putty plant. To put the new mortar business on its feet in the shortest possible time the company has employed Norman G. Hough, former president of the National Lime Association, and more recently general sales manager of the Kelly Inland Lime and Transport Co.

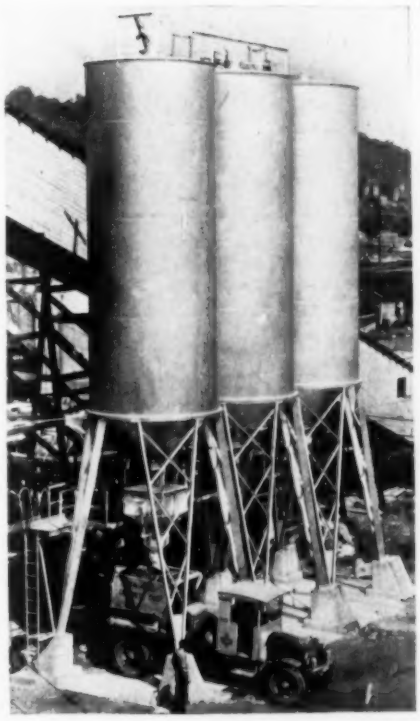
The Cincinnati plant varies from the standard Brooks-Taylor design in that the lime-slaking equipment is placed at ground level alongside the railway tracks and the ageing tanks some distance away on the other side of the belt conveyor serving the ready-mixed concrete plant. Other plants have the lime-slaking equipment adjacent to the ageing tanks. In either case the slaked lime, or initial putty, is pumped to the tanks.

The Richter company has already secured the entire order for all the lime mortar to be used for the large federal housing project in Cincinnati, and has furnished up to 50 cu. yd. a day of mixed mortar for this one job. The contractors are much pleased with the product.

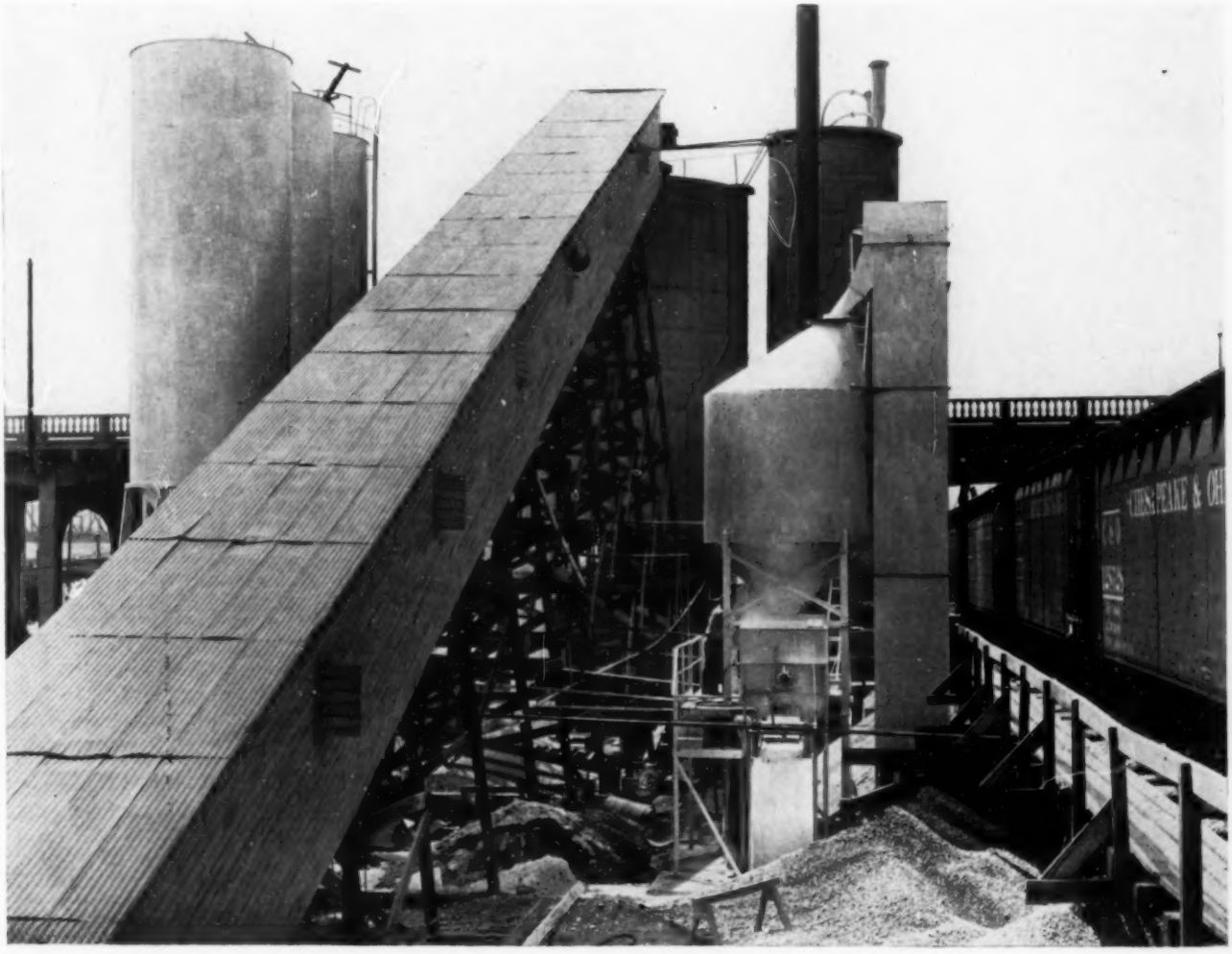
Norman Hough expresses himself well pleased with an opportunity to promote lime mortar in a specific locality,—after having worked many years with members of the lime industry to induce them to do just this. He evidently knows now he can actually show 'em how!

Rock Wool

BRACKTON, KAN., has a rock wool plant, the first in the state. Charles Laid is superintendent.



RIGHT: Lime storage tanks of Richter Concrete Corporation with loading hopper suspended from trolley. BELOW: General view showing hydrator to the right and lime storage tanks to the left of conveyor, which serves a ready-mix concrete plant. Limitation of space due to conveyor location, necessitated the separation of hydrator equipment from the storage tanks



Chemists' Corner

Sub-Sieve Size Distribution

Follows Same Law as for Coarser Particles

An Analysis of Droplets in Emulsion and Particles in Crushed Ores

By FRED DE VANEY and WILL H. COGHILL

MINERAL-DRESSING ENGINEERS have known for some time that if a homogeneous rock or ore is crushed, the distribution of the particles in the finer sizes will follow certain mathematical laws. It seems that this law has not been employed by the chemists. Recently, data of colloid chemists dealing with the size and distribution of droplets in emulsions were investigated. Out of curiosity the data were recast to see if the distribution followed the same law that applies to minerals. The reason for this supposition was that the production of an emulsion is essentially a crushing phenomenon, namely, that of breaking or crushing a liquid into small particles. When recast and assembled the data showed a striking resemblance to the characteristic size-distribution found in crushed ores. This parallelism is shown here in the hope that it may be of interest to both engineers and chemists.

With the engineer the use of sieves became established early, and the material was sorted into sizes that varied as $\sqrt[3]{2}$ or as $\sqrt{2}$. When the sizes were weighed and the percentage of weights, size-by-size, were recorded the result was a screen analysis or a sizing analysis. The colloid chemist has not been so fortunate in dissecting his product. He cannot sort his droplets size-by-size. He has to calibrate and count, in situ, by means of the microscope.

As sieving was so much easier than calibrating and counting, it is not strange that the engineer was the first to give attention to the law of distribution. His study went beyond the finest screen, 40 microns. For the subsieve sizes he has used elutriation or its equivalent and extended the sizing analysis to about 2 microns. Except where anomalous conditions were apparent an orderly trend was always discernible.

Elutriated Material Follows Screen Geometrical Scale

By the use of screens the engineer grouped his products so that the dimensions of the particles in successive products varied in accordance with a chosen geometrical scale. In the absence of a method of screening and elutriation the chemist fortuitously adopted an arithmetical scale. The object of this paper is to present the distribution law as based on the geometrical scale for ground solids and then to show that when the records of the chemist are converted to the same geometrical scale the same law applies to droplets in an emulsion.

Gaudin[4] was the first to devise a manner of plotting sizing analyses so that mathematics could be applied to the curves and numerical values assigned to their slopes. He showed that when the logarithm of the percent-weight retained on any screen and passing the next larger screen in the Tyler standard screen scale was plotted against the logarithm of the screen aperture the resultant curve for the finer sizes of a homogeneous crusher or grinding-mill product would be a straight line. One of his graphs is reproduced in Fig. 1, where he plotted the sieve classification of a homogeneous ore (quartz). The straight-line portion of the curve is called a distribution line. The other line will be mentioned later. If the ore had been heterogeneous or if the crushing had been performed in a disorderly manner, deviations from the orderly trend would have appeared. If Gaudin had elutriated his subsieve material and regulated his overflows so that the particle size of his products would follow the same geometrical scale imposed by the screens, his distribution line would have reached to the smallest micron sizes.

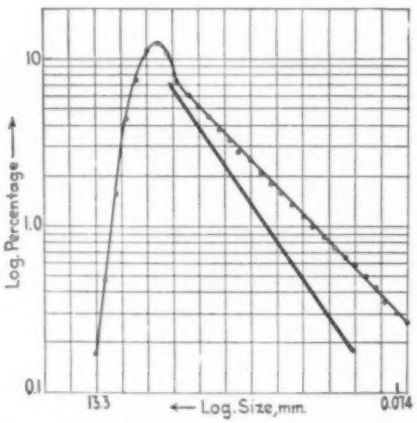


Fig. 1. Size analysis of crushed quartz, according to Gaudin

To illustrate the significance of the log-log plot of the geometrical size-classification of subsieve material, a graph is taken from the work by Cooke[5] and is shown in Fig. 2. It is of the same type as Gaudin's because in both the log-log plot of the geometrical size-classification gives a straight line in the finer sizes.

Analysis of Finer Sizes

What has been said about the straight line at once suggests a corollary; through two points on the log-log plot of a sizing analysis a straight line may be drawn giving the sizing analyses of the finer sizes at the significant intersections. For this to hold true the two points that are selected must be far enough away from the apex of the curve, the ore must be homogeneous, and the crushing must be orderly.

If Gaudin had wished he could have extended his straight line by extrapolation into the subsieve area of the diagram and obtained the percentages of the respective sizes. If such a projec-

tion seems too bold, another method, possibly a little less bold, is available.

By this method the only point required is the one at 200-mesh, but in addition to this the percentage of minus 200-mesh material must be known and

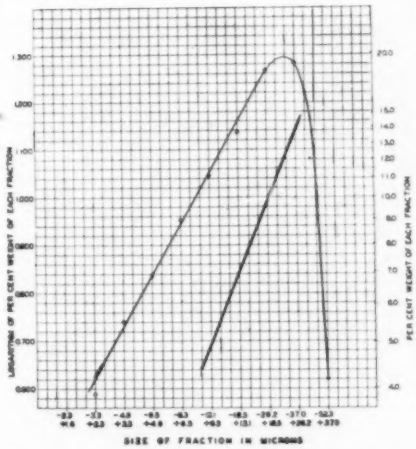


Fig. 2. Size analysis of elutriated material, according to Cooke

a value must be set for the amount of colloidal matter. This has to be determined by test and a value assigned to the particle size. The size will be about one micron. For convenience, therefore, let it be said that the size is one micron: the amount in percent is then subtracted from the percentage of minus 200-mesh size and called *A*. Next, a heavy vertical line is drawn through "one micron" on the chart. The subsequent step requires only a small amount of "jugglin'-in." A straightedge is laid on the point at 200-mesh and made to cut the heavy line so that the percentages intercepted will have a total equal to *A*. Thus, the sizing analyses throughout the series are obtained and the line below 200-mesh will be expected to have the same direction as the one above.

This subject has been dealt with mathematically by Weinig.[6]

Bond and Maxson[7] have set forth a particularly usable procedure for the mathematical consideration of these curves. In their dissertation, however, they issue warnings to discourage the use of mathematics to the exclusion of engineering sense.

Probably the best presentation of the chemists' method of analysis of droplets in emulsions is given by Bogue[8] in Fig. 3. There the investigation of six solutions is shown and the counts are plotted. For the sake of the present study the data have been recalculated (all but sodium oleate + sodium hydroxide) and set to a percent-weight pending on the problem at hand. The reason that the reference line is such a valuable guide is because it has a geometrical scale in Fig. 4. The abscissa conforms to the $\sqrt[4]{2}$ system, whereas it follows the $\sqrt[3]{2}$ in Figs. 1 and 2 dealing with solid particles.

The similarity of the size-analysis for liquids in Fig. 4, and for solids in Figs. 1 and 2 is marked. On the chart for the liquids, the points near the top of the curves are badly scattered, but this may be due to an insufficient number of counts.

Amount of Surface Important

Of next importance to size-analysis is the amount of surface in the respective sizes. A satisfactory calculation of surfaces is made by multiplying the percent-weight by the reciprocal of the openings of the respective screens. The sum of these products gives the relative amount of surface. By another method, the total amount of surface in the fine sizes may be determined directly from the calculated slope of the distribution line.

Ordinarily, the engineer is satisfied with relative values because he considers the absolute beyond his grasp. On the other hand, the chemist may well aspire to expressions that are more specific because he deals with particles, all of which are the same shape—spherical.

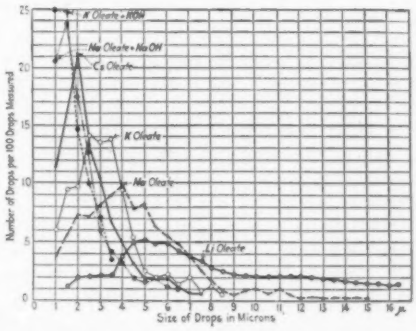


Fig. 3. Graph of the counts of droplets in emulsions, abscissa scale arithmetical, ordinate scale number of drops

Whether either the absolute or relative is sought the use of the reciprocals makes easy the construction of a "reference line" which is a valuable guide. It shows the distribution that would indicate the same amount of surface in each size. This reference line has been added to the three charts that are on a logarithmic scale.

In the milling of ores, the engineer seeks a selectively ground product that will give a distribution line as steep as possible because he wishes to finish at a certain size without an undue amount of fines. In the grinding of cement clinker and coal he may or may not strive for a steep distribution line. The chemist will have his preference, departicular significance with respect to amount of surface and stands near a mean position of all distribution lines.

The distribution line for the liquids is much steeper than the reference line, and for the solids it is much flatter. The engineer would welcome crushing machinery that would make products

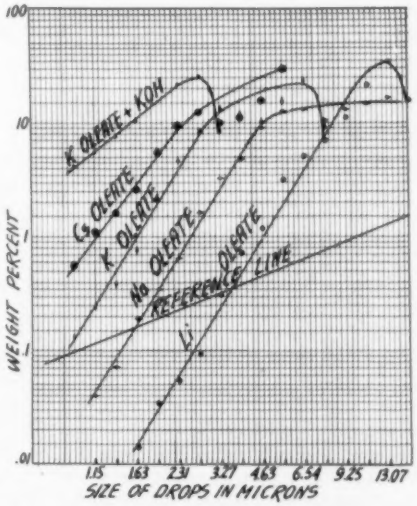


Fig. 4. Size analysis of droplets in emulsion, according to De Vany and Coghill

having a distribution like that of the droplets in emulsions.

Conclusion

An examination of the size-analyses of droplets in emulsions and of particles in crushed ores when plotted on a log-log scale indicates that they follow the same law of crushing.

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1) Published by permission of the Dir., U. S. Bureau of Mines as coöperative work between the U. S. Bureau of Mines and the Missouri School of Mines and Metallurgy, Rolla, Mo. (Not subject to copyright.)

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HINTS AND HELPS FOR SUPERINTENDENTS

Portable Lathe

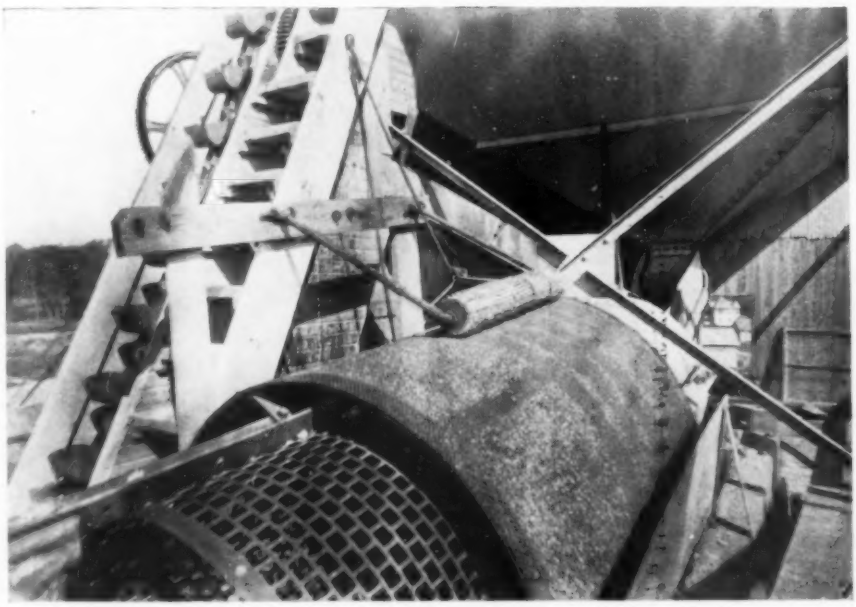
FLORIDA PORTLAND CEMENT CO., Hookers Point, Fla., converted a small Ingersoll-Rand, 1-ton size DU, air hoist (¾-in. intake and 1-in. exhaust) into one of the most useful tools about the plant. For example:

Occasionally the collecting rings of the 75-hp. variable-speed Allis-Chalmers motors driving the 175-ft. kilns must be turned down. The normal procedure would be to shut down the kiln for two or three days, disconnect the motor and uncouple the shaft. As the rings are pressed on to this section of shaft, it would be necessary to take this section with the rings on it to the machine shop to turn the rings down. This necessitates a great deal of work, and two or three days shut-down, when the business might demand that the kiln be operating.

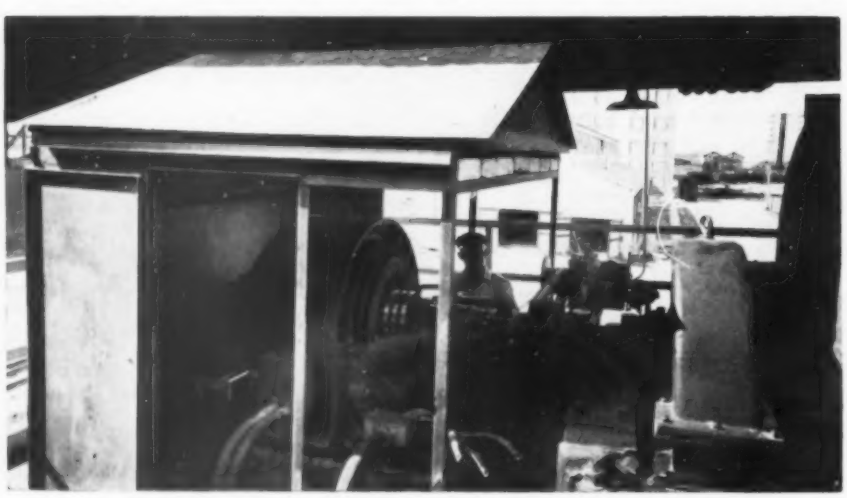
The air hoist, which can be carried easily by two men, is brought up and mounted either on a beam or plank by means of bolts, with its pulley in line with the coupling flange next the motor. A belt, the width of the coupling flange (2½ in.), is put on the pulley of the air-hoist and run over this coupling flange, which is used as a pulley on the other end. The connection between the two coupling flanges is broken so that only the rotor and collecting rings are free to move.

An ordinary lathe mandrel and tool is set up adjacent to the rings to be turned. The air hoist having a variable speed (operating at 30 to 100 lb. pressure from the Chicago Pneumatic Tool Co. compressor), the speed of rotation of the rings and motor rotor can be regulated to ordinary lathe speed, and the rings are turned down in place. It requires about a half hour to set up the apparatus and from 1 to 1½ hours to turn down the three rings, in this way.

This hoist has been used to turn down rings on other motors located at high places such as on top of the 90-ft. traveling crane for loading rock into bins, where great savings in time and energy are accomplished. Similarly it is employed to scrape coal into boat hatches, for hoisting kiln brick to the kiln floor, and loading the raw and finishing mills.



Screen cleaner for dislodging small gravel in the wire meshes. Note brackets for moving roller to other end of screen



Air hoist used to turn down collector rings on kiln drive motors eliminates long delays for repairs. Note belt to air compressor, using coupling flange as a pulley

Screen Cleaner

VARIOUS devices to prevent the blinding of small-opening gravel screens have been tried—some of them patented. They usually consist of wood or rubber rollers, sometimes a roller brush, which press down on the screen and revolve with it.

At the Marietta Concrete Corp. plant, Marietta, Ohio (see ROCK PRODUCTS, March, 1937, pp. 85-89) they have improved this device as follows:

Five cylindrical sections, each about 6 in. long and 5 in. in diameter are mounted on a common 1-in. shaft or axle to form a single roller about 2½ ft. long. The ends of this shaft are bent up at right angles and pivoted to a stringer over the screen.

Each cylinder has a number of ⅛-in. spikes, 2-in. projecting, driven into it, radially. As the screen revolves the rollers of course revolve in the opposite direction, and the spikes in each roller find the screen perforations and punch out the gravel lodged in them. A single roll unit would not do, of course, for it would not be possible to

place the spikes so that all would find the screen openings at the same time.

A separate set of hinges permits the set of rollers to be moved to the other half of the screen jacket, so that a full length roller is not needed.

Rebuilding Bucket Teeth*

By T. B. JEFFERSON,
Assistant Plant Engineer,
Fort Peck Dam, Mont.

BUCKETS OR DIPPERS and most of their parts are made of one of two materials, either high carbon steel or manganese steel. Parts made of either of these materials may be repaired in a number of different ways. The most common methods used for sharpening dull teeth are either (1) to forge the blunt rounded end of the tooth into a point or (2) to rebuild the tooth to its original shape by welding. Either method will produce much more satisfactory results if the finished product is protected by an application of hardfacing.

The use of welding, either the oxy-acetylene or the electric-arc process, will probably prove to be a more satisfactory means of reconditioning dull teeth than forging as far as the average contractor is concerned. When a tooth is sharpened by forging, an operation that consists of drawing the blunt end of the tooth into the form of a tapered wedge, its shape and length is usually changed. Thus a bucket fitted with several teeth sharpened in this manner may have teeth of varying length. This condition would result in severe wear on the longer teeth while the shorter teeth do very little work. Eventually, the teeth become so badly worn they must be replaced because none of the worn metal is replaced in this sharpening process and insufficient metal remains for further drawing.

In effecting tooth repairs by welding there are several methods which are adaptable to both the oxy-acetylene and the electric art processes. It should always be remembered in the repairing of teeth and other bucket parts that the electric arc or the oxy-acetylene processes are equally suited for use on carbon steel parts. On manganese steel parts, however, only the electric arc should be used since the excessive heat of the oxy-acetylene method tends to make the manganese steel brittle.

If the tip of the tooth is worn only to the extent that it is blunt it may easily be reconditioned. It is simply a matter of replacing the metal that has been worn away with a high carbon weld deposit. This procedure is shown in Fig. 1. To avoid depositing an excessive amount of weld metal, the tooth is placed on a backing plate before welding is begun. This plate serves several purposes; it assures one face of the tooth will be smooth and fairly true, it also eliminates considerable grinding and prevents the sticking of deposited metal to the work table, etc. In the electric arc application this backing plate should be of copper, while in the oxy-acetylene application the copper plate should be replaced by a fire brick or a heavy piece of cast iron.

When depositing high carbon steel on manganese, or the reverse, a layer of stainless steel should always be deposited between the base metal and the added metal; otherwise the difference in the coefficient of expansion of these two metals will result in their tending to pull apart. As a result of these stresses the deposited metal will soon develop cracks and finally be broken off. Likewise, if hardfacing material is deposited over $\frac{1}{16}$-in. thick it will be broken off because this low tensile strength material is not capable of withstanding shocks and working stresses.

FIG. 1—Reconditioning a worn tooth by building up a high carbon weld deposit. Note the backing strip.

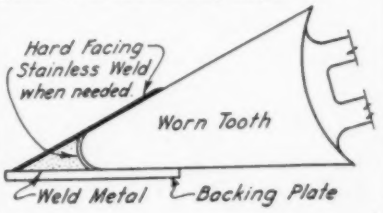


FIG. 2—Repairing a broken tooth by welding on a wedge with a double V butt weld.

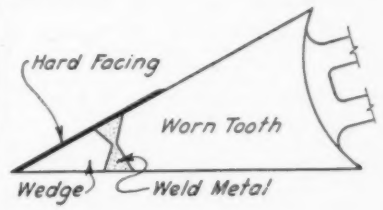
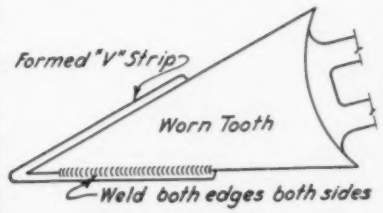


FIG. 3—Reshaping a worn tooth by welding on a V-shaped strip, which may be made from a truck spring leaf.



Should the tip of the tooth be broken off, rather than worn away, the necessary repairs should be made as shown in Fig. 2. In this application the broken tip is replaced by welding a wedge to the remainder of the tooth. These wedges may be cut from either a piece of carbon steel or an old manganese part and forged into a shape similar to the missing tooth tip. The tooth should be trimmed so that this welding operation will consist only of making a double V butt weld. If a manganese wedge is to be welded to either a manganese or a high carbon tooth a stainless steel rod should be used. The same is true when a high carbon wedge is welded to a manganese tooth, but when both the wedge and the tooth are carbon steel a high carbon rod will produce satisfactory results.

A third method of rebuilding a broken or worn tooth is pictured in Fig. 3. It consists of forming a piece of high carbon steel into the shape of a "V" so that it can be slipped over both faces of the tooth and welded to it along the edges. An old automobile or truck spring leaf is excellent material for this "V" strip. In repairing a high carbon tooth in this manner a high carbon rod is used for either the electric arc or the oxy-acetylene application. However, if it is a manganese tooth a stainless steel electrode should be used for the electric application while a manganese bronze rod is the choice for welding the "V" strip with the oxy-acetylene process.

After the tooth has been rebuilt it should be hard-faced, Fig. 4. Teeth are more easily maintained if hardfaced when new. Likewise, more satisfactory results will be obtained if the tooth is reclaimed when only slightly worn.

The types of hard metal overlay to be applied to a tooth and the methods of application vary greatly with the kinds of digging to which the teeth are to be subjected. If the excavating machine is moving rock or gravel the bucket teeth as well as the lip should be hardfaced with an austenitic type of hardfacing material. This self-hardening metal should be applied to all of the exposed surfaces of the tooth and lip.

For digging in sand or earth a martensitic type welding rod should be used so that these parts will be protected from abrasion by a material of high initial hardness. The teeth that are on the sand digging bucket should also be faced on all surfaces, while the teeth that are digging in earth should have hard surfacing on the top face only. When a tooth is hardfaced on only the top of the tooth the softer metal on the bottom will wear away faster, sharpening the tooth as it is used. This self sharpening feature will make the digging of hard compact soil much easier.

*Reprinted from Western Construction News, July, 1937.

Quenast Quarries, Belgium, Produce

CUBICAL CRUSHED STONE

In Many Sizes By Interesting Method

By PIERRE HANKER

IN THE PAST 20 years the methods of hard stone crushing have undergone a considerable improvement in all countries. Crushing plants established in Belgium in the past 30 years formerly comprised one or more crushing mills of the old jaw type and one or two grate-like grizzley screens. These grates allowed the classification of crushed stone into six or seven sizes, principally: dust (sand) 0 to 2 mm.; gravel, 2 to 5 and 5 to 20 mm.; ballast, 10 to 50 mm.; and macadam, 20 to 40, 20 to 60, and 40 to 60 mm. (1 mm. = 0.0394-in.)

Specifications of contractors using crushed stone were rather brief, the only requirements being that the stone come from good hard rock, free from foreign materials and screened between two dimension limits, relatively accurately. They attached scarcely any importance whatever to the shape of the stone, except, as always, that macadam

Endless chain system drives cars from quarry to crusher and return

stone should not contain too many flat or sharp-edged pieces.

Demand Many Sizes

In the last few years, however, contractors engaged in resurfacing highways with asphaltic and cement concrete and also manufacturers of concrete products, have attached a growing importance to the form and shape of the stone in the mixture and have required that material meet detailed specifications.

Experience has shown that in resurfacing highways, as well as in the fabrication of concrete products, the best results are obtained when the stone in the mixture is reasonably cubical or spherical in shape. The term "cubical" is the one more generally employed in technical literature.

Stones cubical in shape possess a far greater cohesive resistance than do flat pieces. Thus, in mixtures for asphaltic and cement concrete, the cubical-shaped stones have, for the same gradation, a much less percentage of voids than mixtures of flat-shaped stones. Consequently, for the same tensile strength, it is possible to reduce the quantity of a mixture of cubical-shaped stones.

View of Quenast crushing and screening plant. Left to right, arrows point to aerial conveyor, reinforced concrete storage silos over which final screening is done, primary screening and secondary crushing plant, and to extreme right, primary crusher plant

With these motives in mind, all sorts of new specifications have appeared in the handbooks of engineers in the past two or three years, all relative to the gradation and shape of the crushed stone, taking into consideration its proper strength, adhesive, and cohesive properties.

Manufacturers of crushed stone thus found themselves confronted with a double problem: first to multiply the number of sizes relative to dimension; second to manufacture, in some of these sizes, forms reasonably cubic in shape, at the same time complying with well determined requisites of gradation.

Most of the old crushing plants were inadequately equipped to economically solve these problems. In Belgium, though, a veritable hive of crushing plants has been busy during the past 15 years modernizing equipment.

New crushing and screening equipment installations in the quarries at Quenast, Belgium, are among the most important in that country and perhaps the most modern. They have been studied with special emphasis because of the large number of sizes produced, the cubical shape of which comply with the most exacting requirements. These plants were erected in 1930-31; they have a production capacity of 250 tons per hour, and a storage capacity of 120,000 tons.

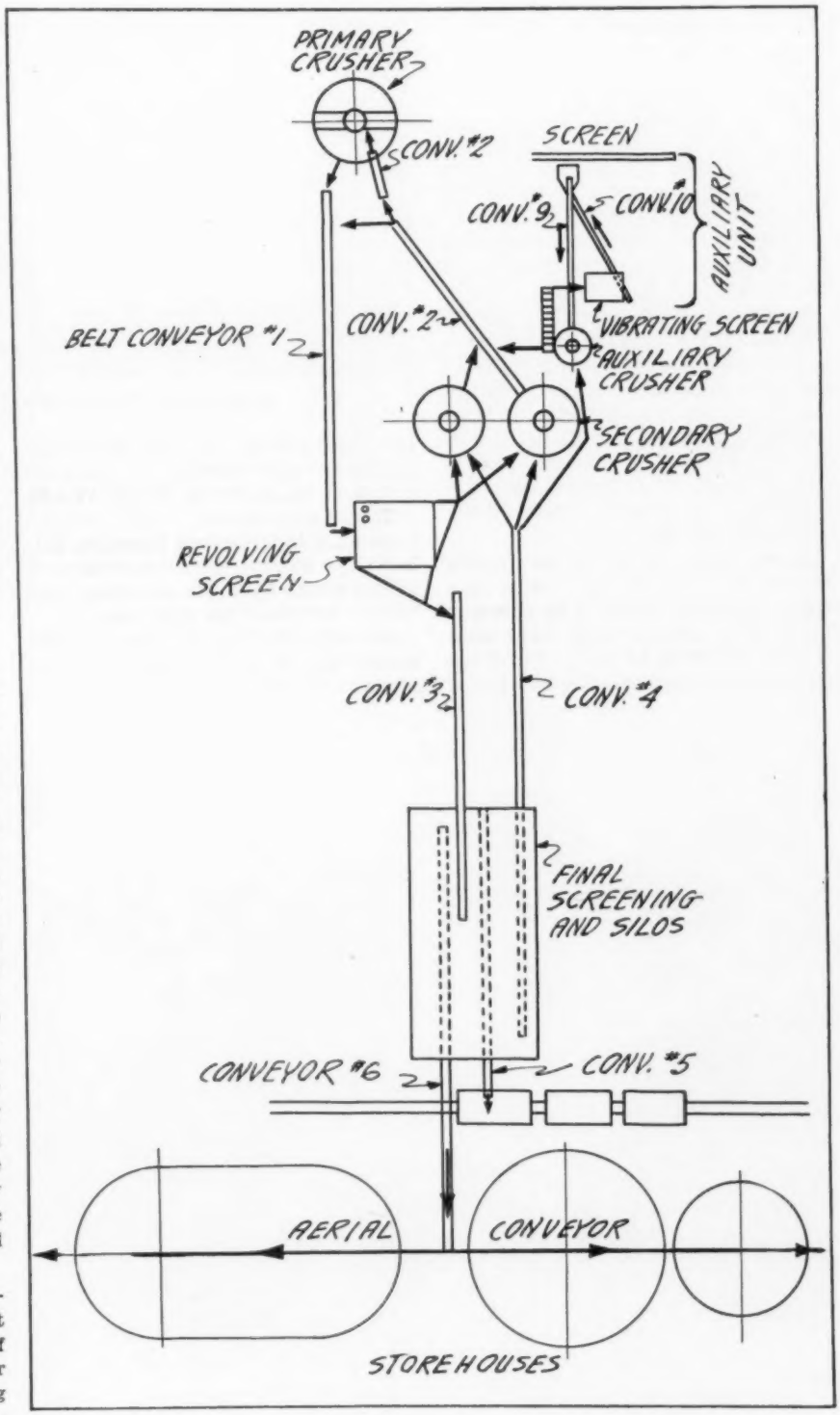
Endless Chain System

Rock is transported from the quarries to the primary crusher over two networks of track on which dump cars are hauled by means of an endless chain system. The primary crusher is a gyratory type having a maximum opening of 2000 mm. and a minimum of 500 mm. (This is type No. 20 of the American series.) The crusher is installed in a building under the tracks of the narrow gauge rail system, equipment being made accessible by an overhead bridge, capable of supporting a load of ten tons, arranged with an eye to rapid repairs to any parts in need of replacement. Delays in operation of the gyratory crusher are reduced to a minimum by having available two spare mantels of different diameters which may be used for replacements when repairs are made. The crusher was originally operated by an electric motor, the drive being through shafting, a pulley, and ordinary belting.

In the past few months this arrangement has been replaced by direct electric motor drive. This method of powering the primary crusher is rather exceptional, and quarry men have long expressed certain doubts on this subject, but it has produced some interesting results at Quenast. Better results are explained by the fact that when transmission by belting is used, there is always an appreciable amount of slippage, resulting in a slackening of speed of the crusher, which has considerable influence on production since it always occurs at moments of greatest load.

Crushing and Screening Operations

Throughs from the primary crusher empty directly on to a belt conveyor, whose pulley has a magnetic head designed to remove tramp iron. This conveyor deposits the crushed stone on a revolving screen having openings of 75



Flow sheet of crushing and screening operations at Quenast Quarries

mm. diameter. Throughs from this screen are carried directly, by means of belt conveyor No. 3, to the final screening units.

The oversize stone is by-passed to one of the two secondary crushers. The secondary crushers are of the cone gyratory type, 4 ft. in diameter. The feed to these machines is controlled by means of feeder troughs which are powered by an electric motor, with an arrangement for reduced speed and a graduated load limit.

Throughs from either one or the other of the two secondary crushers are carried by belt conveyors No. 2 which run into a by-pass device which permits either all of the stone to be carried over conveyor No. 1, or only the smallest or largest sizes, or to pass stone again through the system by means of belt conveyor No. 2.

This method of separation permits the use of the primary crusher as a secondary crusher for the largest stones, and it is principally employed in this manner during periods of low production, which allows the shutting down of one of the secondary crushers, or even both of them, by deflecting the oversize from the revolving screen directly to conveyor No. 2.

All the stone which has been finally reduced to minus 75 mm. size is carried to the final screening by conveyor No. 3. The final screening takes place above a group of 13 silos. There are four eccentric type screens, two grates (grizzleys) and six vibrating sieves. This system normally handles screenings of 1, 2, 3, 5, 10, 20, 30, 40, 60 and 75 mm.

Bench method of quarrying and trackage in Quenast Quarries

The 13 silos receive the 11 sizes corresponding to the screen throughs; ballast 10 to 50 mm., with the elimination of flat pieces from the macadam; and "filler," providing the dust size.

Through blending of the changing proportions of certain sizes normally produced, a whole new series of other sample sizes of a well determined metric gradation is obtained.

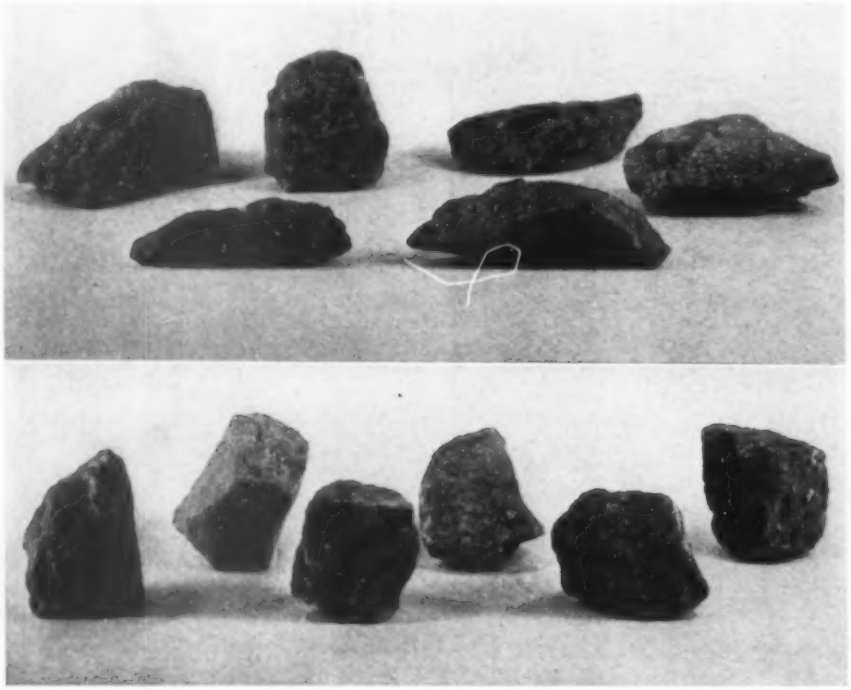
Silos are of reinforced concrete with flat bottoms, each of which has three small discharge openings. Under the silos are three conveyors.

Conveyor No. 4 carries stone which is to be recrushed in the secondary crushers. Conveyor No. 5 carries the stone which is to be loaded on the cars. Conveyor No. 6 places the stone destined for storage in intermediary hoppers, an aerial conveyor leading to the storage.

These three conveyors, by a system of traps, permit production to be regulated according to the blend of sizes desired, as well as the production rate of recrushing.

As shown in the flow sheet, the groups of crushing and screening units are operated in two circuits, arranged so that one of these units may be cut out of operation at any time. This arrangement is extremely useful, permitting continued recrushing in one crusher and shutting down the other in periods of more or less slack production.

In addition to the equipment just described, there is also a small independent auxiliary unit, a gyratory crusher of 250 mm. openings, and a vibrating sieve running off a closed circuit through an elevator and two belt conveyors. The crusher can be fed either from conveyor No. 4, or from the quarry cars themselves. Consequently, it can be used for the recrushing of small stone sizes for the silos as well as for grinding other various advertised products, such as quartz, silex, brick compound, etc.



Above—Stone with relatively flat surfaces as it comes from primary crusher. Below—After passing through secondary crusher stone takes on a cubical shape

Methods of Obtaining Cubical Shaped Stone

Manufacture of crushed stone in a form reasonably cubical constitutes a problem difficult to solve, and its solution necessitates a considerable number of relatively difficult experiments.

Natural breakage of ordinary stone, particularly hard stone, generally results in a large proportion of flat pieces and those with sharp-edged points. The number of these flat and sharp pieces depends, regardless of the nature of the stone, on several factors, which include: the type of crusher, the speed at which it functions, the form and surface of the fixed and mobile grinding mechanism, the reduction of the actual dimensions in the crushing unit itself, etc.

In general, through an adequate adjustment of the dimensions of the crusher itself, an improvement as to the form of the crushed stone can be obtained, particularly in the handling of stone that is relatively soft. As for hard stone, the results that can be obtained directly in this manner are more limited. It has been demonstrated time and again that a reduction by a single operation on a piece of stone from which a smaller size is desired produces a high proportion of flat and sharp pieces, but that the same dimension reduction obtained through two or three successive crushings produces a product more reasonably cubical in form. A radical improvement in the form of crushed hard stone, then, in general, can be obtained in two or more successive crushing operations.

These recrushings should be made when the crusher is as nearly full as possible for in this manner the flat and sharp edges are worn effectively by the compression of one against the other, more than by the metallic devices of the crusher itself. Successive recrushing under these conditions wears off the sharp edges equally by fragmentation and greatly improves the form of the stones without in any way reducing their screening dimensions. In these operations the desired effect of cubicity is more rapidly achieved in the treatment of soft or semi-soft stones as they wear more easily and round off their own edges in their passage through the crusher filled with material. The softer the stone, the more the crushed pieces assume an almost cubical shape, while the recrushing of hard stone presents figures that have more or less plane faces with right or obtuse angles.

It can be seen at once that the latter form is much more advantageous in resurfacing highways in that they present a surface on the highway like a veritable mosaic of broken stones.

AUTHOR'S NOTE

CONDITIONS governing production and utilization of crushed stone are much different in Europe, and especially in Belgium, than they are in the United States. To understand the situation better, the reader should bear in mind the following points:

The quarries at Quenast are located in the center of Belgium, a small country with a very dense population.

Belgian hard stone quarries sell their products in Belgium, the north of France, in Holland, a country possessing no hard rock deposits, and in the south of England.

Belgian quarries must, therefore, meet the specifications of four different countries, and one of which, England, does not use the metric system.

This explains the necessity of making up a large number of samples, all different in dimension, metric gradation and form.

Moreover, Belgian quarries being very numerous, competition is keen, causing them to strive for improvements in their products which would make them sell more easily.

Finally, from a technical point of view, the quarries at Quenast produce 120,000 tons of paving stone annually, entailing a heavy production of crushed stone. As a result, the size destined for crushing are, in general, relatively small, the largest not exceeding 80 kilos. (Kilogram or kilo = 2.204 lb.)

—PIERRE HANKER

Now for a sample of given size, that is, screened between two precise dimensions, the gradation of the product resulting from the recrushing normally appears semi-flat. An examination of two of these types as to gradation revealed that in one, the majority of pieces tended to conform to an almost constant medium, while in the second, there appeared forms of a more varied dimension. It follows that in order to realize a medium of cubical stone, presenting a minimum of voids, it is necessary to attain a gradation of forms by graduating several samples of appropriate dimensions.

Computations revealed to engineers the necessity of increasing limits of screenings, for example, from 5 to 32 mm. This extension of dimension limits brought about a second combination of facts. It was learned that when a cubical shaped product had been fabricated between two dimension limits again extended, and with a determined gradation, piling it in the storehouse or even loading it on cars or boats creates a very marked separation of the smaller and larger pieces. Of the material on hand thus piled up, ranging from 5 to 32 mm., the large pieces ranging from about 20 to 32 mm. are always found at the foot of the pile, while the small pieces of about 5 to 20 mm. gather in the center at the top of the pile.

Without special precautions in handling, principally by mechanical devices, material of considerably different diametrical gradation will be found in successive layers making up the pile.

Fight Municipal Plant

DES MOINES, IA., producers of sand and gravel, under the leadership of Gaylord Gray, manager of the Central Iowa Sand and Gravel Co., are fighting vigorously to keep the city from erecting its own plant to supply 56,000 cu. yd. of gravel for its sewage filter beds. As every producer who has supplied or bid on such material knows, this is a high cost product requiring special properties and preparation. The city fathers "have been told" that they can produce it in a $10,000 plant. With local raw materials, the product would have to consist of hand-picked boulders, crushed to specification sizes.

Lightning Destroys Motor House

CHICAGO GRAVEL CO., Oswego, Ill., suffered the loss of its motor house which was destroyed recently by lightning. The loss was estimated to be about $4000.

New President

LAWRENCE PORTLAND CEMENT CO., New York City, directors have elected Warren W. Ayers, former vice president and director, president to succeed the late Frank H. Smith. Mr. Ayers has been in the New York Stock Exchange firm of Kean, Taylor & Co. since 1925; he is retiring from this firm as of September 30. Prior to 1925 he was assistant treasurer of the Bankers Trust Co., New York City.

New Cement Plant?

COTTON STATES PORTLAND CEMENT CO., Jackson, Miss., has been incorporated, which makes it look as if the long agitated scheme for a cement plant in that state is being revived.

NATIONAL ASSOCIATION *Activities*

Crushed Stone

ADMINISTRATIVE DIRECTOR BOYD has mailed out a plan of the exhibit space available for the January convention and a contract form to all associate members of the National Crushed Stone Association. At the same time a drive is being made for new associate members, since the exhibit space at the Netherland Plaza hotel at Cincinnati is ample. Mr. Boyd was in Chicago and other midwest cities recently in the interests of the manufacturers' division of the association, of which Max Lambert, Robins Conveying Co., Chicago office, is chairman. The exhibit will be formally opened Monday night, January 24, with a buffet supper.

• • •

During October a series of regional meetings of producers will be continued. These meetings give producers an opportunity to get better acquainted with Administrative Director Boyd and Engineering Director Goldbeck, and to know more about how the national association is serving its industry. The October meetings are in the East. During September a meeting was held with Indiana producers at Indianapolis. There were no complications here due to the fact that the Indiana crushed stone producers are joined locally in the same association with the sand and gravel producers—the Indiana Mineral Aggregates Association.

Sand and Gravel

EXECUTIVE SECRETARY AHEARN has mailed out contract forms for space at the annual convention's machinery exhibit to associate members of the National Sand and Gravel Association and the National Ready-Mixed Concrete Association. The same layout for the exhibit space will hold over from the convention of the National Crushed Stone Association, which occurs the week previously, and associate members of both these associations may retain the same space if they desire. L. W. Shugg, General Electric Co., Schenectady, N. Y., is director of both exhibits. The exhibit will be formally opened on the evening of January 31 with a buffet supper. Bradley S. Carr, American Manganese Steel Co., Chicago Heights, Ill., is chairman of the manufacturers' division of the National Sand and Gravel Association.

1938 Conventions

AMERICAN Road Congress, Machinery Show and convention of American Road Builders' Association, Cleveland, Ohio, January 17-22.

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NATIONAL Crushed Stone Association, annual convention and machinery exhibit at Cincinnati, Ohio, January 24-26, incl., Netherland Plaza Hotel.

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NATIONAL Sand and Gravel Association, annual convention and machinery exhibit at Cincinnati, Ohio, February 1-3, incl., Netherland Plaza Hotel.

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NATIONAL Ready Mixed Concrete Association, annual convention and machinery exhibit, February 1-3, incl., Netherland Plaza Hotel.

Secretary Ahearn has left no doubt as to his opinion of the Black-Connery bill for fixing minimum wages and hours of labor, defeated in the House of Representatives after adoption by the Senate in the recent session of Congress. Unfortunately the Administration still believes it can force its passage when Congress meets again—maybe it can. Mr. Ahearn says in a letter to members:

"It seems difficult to believe that the Black-Connery bill will pass if it is fully understood. It is the most drastic legislation proposed in the last four years, not even excluding the N. R. A. It will call for a control in Washington of the most remote phases of all industry, and the Board is given what amounts to a roving authority to do as it pleases in the fixing of employment standards in all of their phases. Characteristic of the confusion which permeates the bill is a provision in Section 10 that Board hearings 'shall be held at a point as near the principal place of business of the employer involved as is practicable.' This would seem to anticipate that the Board will make a separate ruling on wages and hours for each company in each industry, and yet the whole substance of the bill, including the Green amendments, requires a vertical determination for each industry of wage and hour standards. The Chairman of the Labor Committee (of the House), however, naively proclaims that Section 10 will remove the criticism that employers

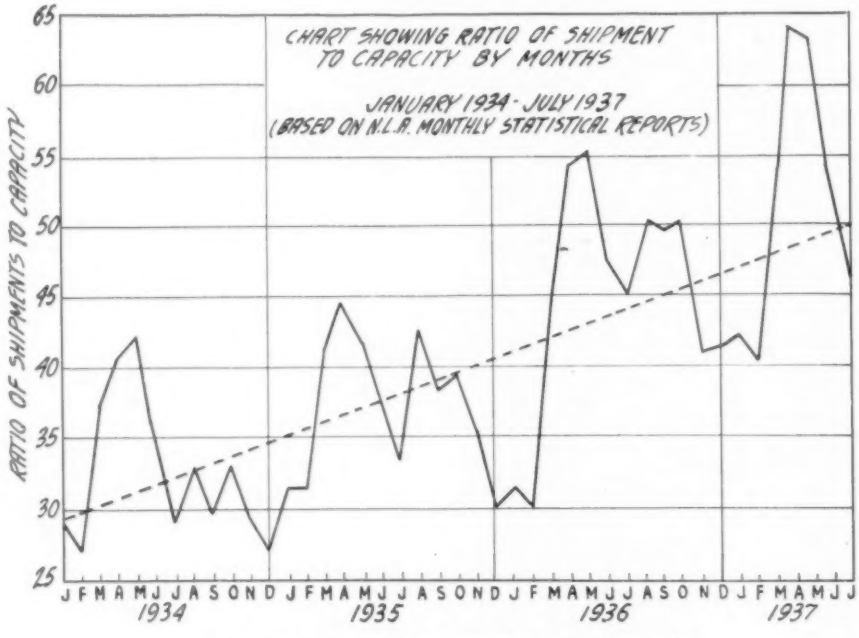
CHART SHOWING RATIO OF SHIPMENT TO CAPACITY BY MONTHS
JANUARY 1934 - JULY 1937
(BASED ON N.L.R. MONTHLY STATISTICAL REPORTS)
RATIO OF SHIPMENTS TO CAPACITY
65
60
55
50
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J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J
1934
1935
1936
1937

Graph showing seasonal fluctuations in lime shipments

and employes will have to come to Washington to have a voice in the rulings of the Board."

Lime

S. WALTER STAUFFER, president of the National Lime Association, announces that the association has available for its member companies six new sound films, issued by the National Association of Manufacturers, dealing with problems of interest to employes, which will gladly be loaned for showing at safety meetings and other gatherings. The films deal with both safety and economic problems of industry.

●

Research work on mortars continues at the Massachusetts Institute of Technology, and the association is constantly getting favorable publicity for the work already accomplished. A part of this research is a microscopic study of mortar bond in old structures and members of the association and others interested are requested to send the Institute specimens from old buildings.

●

The accompanying chart was recently developed by the association to show the trend of lime shipments January 1934-July 1937, with respect to percentage of capacity. The graph shows clearly the seasonal fluctuations.

Ready Mixed Concrete

H. F. THOMSON, vice-president of the General Materials Co., St. Louis, Mo., has rendered the National Ready Mixed Concrete Association, and the industry generally, an excellent service through an article he contributed to August 19 issue of *Engineering News-Record* on "Merchandising Designed Concrete." In introducing the article, the editor says:

"The manufacture and servicing of ready-mixed concrete has developed a technology that is ranking it among the standard materials of construction. With the increasing use of ready-mix, knowledge of this technology is important so that the user may know what he may reasonably ask in quality and variety of product and in volume, regularity and distance of delivery. An experienced producer answers these questions and gives facts that will be surprising to many engineers who have not closely followed recent developments."

Mr. Thomson is a past-president of the National Ready Mixed Concrete Association and has been one of its most consistent and patient boosters. His article should be read by producers as well as by the engineer consumers whom it is designed for, because it is an excellent sales argument.

Industrial Sand

NATIONAL INDUSTRIAL SAND ASSOCIATION, through Executive Secretary Ahearn, has announced the semi-annual meeting of the board of directors at Chicago (Palmer House) for October 5. A. Warsaw, Chicago, is president. All member companies are invited to the open session.

Cement

PORTLAND CEMENT ASSOCIATION will hold its semi-annual business meeting at the Blackstone Hotel, Chicago, November 29, 30 and December 1.

Prize Winner

National Crushed Stone Association Safety Competition covering the calendar year 1936 was the eleventh yearly safety contest conducted by the United States Bureau of Mines in coöperation with the Association. There were 54 plants, consisting of four underground mines and fifty open-quarries located in 17 states, that participated in the contest, and of these, fourteen worked a total of 1,135,633 man-hours during the year without an accident causing loss of time to any of the employes. The records reveal that 6,733,950 man-hours of work was accomplished during the year, which was 55 percent more than that represented by the enrollment in the previous year's contest.

The Explosives Engineer of the Hercules Powder Co., provided a trophy for presentation to the company that established the best safety record, that is, the mine or quarry whose record showed the fewest days lost from accidents per thousand man-hours of exposure. When two or more plants are operated without an accident, the company working the largest number of man-hours is awarded the trophy, each of the other plants receiving a certificate of honorable mention for its efforts in advancing safety and eliminating accidents.

The trophy for 1936 was won by the Krause No. 1 quarry, St. Clair County, Illinois, near Columbia, Ill., operated by the Columbia Quarry Co., St. Louis, Mo. During 1936 this quarry worked 224,342 man-hours without a lost-time accident. This plant has established an accident-free record of 726,998 man-hours during the past four years, 1933 to 1936 inclusive; and during that period the plant was awarded the trophy in 1935 and honorable mention in 1933 and 1934. As a matter of fact this plant and quarry has operated from September 22, 1932, to September 22, 1937, a total of 928,675 man hours without a lost-time accident. E. A. Heise is the company's safety engineer.

During the 1936 contest, in addition to the trophy winner, 11 quarries and two underground mines operated with perfect accident records; and each was therefore awarded a certificate of honorable mention. The plants winning the certificates for accident-free records were included in the list published on p. 100 of ROCK PRODUCTS for September, 1937.

Industrial Minerals

AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS will hold its annual industrial minerals division meeting at Washington, D. C., and College Park, Md., October 14 and 15. The program includes a paper on churn drilling as practiced by the Consolidated Quarries Co., by Nelson Severinghaus, superintendent; mining methods of the Peerless White Lime Co., by R. Smith, mining engineer; sand and gravel specifications by Stanton Walker, National Sand and Gravel Association, and other papers of interest to rock products producers. All producers are invited.

Coloring Stuccos

BUILDING RESEARCH BOARD, (British) Department of Industrial and Scientific Research, London, England, has recently tested a method of coloring stuccos, which is of quite a novel character. It consists in the use of sand, treated with a metallic oxide to produce a colored skin which is stated to be an integral part of the sand grains. The resistance of the colored sand to alkalies and acids is such that it should be unaffected by the lime and alkalies in cement or by polluted town atmospheres and there was no indication that the mechanical properties of cement with which it is used would be adversely affected. The method described is evidently that patented and used in the United States by the Minnesota Mining and Manufacturing Co., at Wausaw, Wis., and other places to make silica granules of green color.

A. F. of L. vs. C. I. O.

COWELL PORTLAND CEMENT CO., Cowell, Calif., was closed for about six weeks while local A. F. of L. and C. I. O. unions fought it out. The new A. F. of L. local, Lime and Cement Employes' Union of Contra Costa County, won. At a subsequent hearing before the local representative of the National Labor Relations Board, to which the C. I. O. appealed, the company contended that the N. L. R. B. had no jurisdiction because the cement company was not engaged in interstate commerce. The examiner recessed to obtain legal advice.

LIME PRODUCERS' FORUM

Conducted by Victor J. Azbe, Contributing Editor, St. Louis, Mo.

COMPARE PERFORMANCES OF LIME KILNS

WHILE THERE ARE NOW several center burner plants using producer as well as natural gas, the Glen Park plant may be considered the most outstanding. The results here, as to capacity, are a rate of 1800 lb. of lime per square feet of shaft area or 54 tons per day which, as soon as night charging will be made practicable, will be increased to over 60 tons per day. While even now it would be entirely possible to operate the kiln at 60 tons, it then would be half empty by morning. The gas consumption is about 5000 cu. ft of 1000 B. t. u. Quality is 95 percent to 97 percent CaO, and the weight of daily core is 1440 lb. or 1½ percent. Lime is drawn every hour and a half, and the kiln trimmed each time. During this 15 minute period, all the gas is shut off, and as a result for four hours a day the kiln gets no gas and therefore all fuel is burned during the remaining 20 hours, producing lime at the rate of 65 tons per day. As the oval kiln shell is only of average diameter, this rate of production must be considered outstanding.

In both the Glen Park plant and the one at Moosehorn Manitoba, where this same system is in application but using producer gas, the kilns have a reliable running period of a year or more. In both of these places, previously, the refractory problem was a serious problem, indeed, and kiln life was short and indefinite.

The tabulation shows performances with relation to size of the three producer gas and one natural gas fired kilns. The Moosehorn plant is operating with center burners exclusively, and is probably the only gas-fired kiln putting out 30 tons of lime for a shell diameter of 11 ft. Other kilns of this size are known to the writer to be producing only 6 tons of lime a day, while this one could readily increase its capacity if it was desired to drive it at a higher rate. It could produce 40 tons, which is the top production per square foot. These kilns were quite a problem at one time, but changing them here and there and adopting the methods discussed in this paper has worked wonders.

KILN DIMENSIONS AND PROPORTIONATE CAPACITIES

Plant	St. Genevieve Missouri	Ivanhoe Virginia	Glen Park Missouri	Moosehorn Manitoba
Capacity	60	50	55	30
Kind of Lime	High Calc.	High Calc.	High Calc.	High Calc.
Size of Stone	Large	Large	Large	Medium
Kind of Fuel	Bitumns. 12000 Btu	Bitumns. 14500 Btu	Nat. Gas 975 Btu	Bitumns. 14000 Btu
Firing Method	Automat. Gas Prod.	Automat. Gas Prod.	Center Burner	Automat. Gas Prod.
Kind of Draft	Induced 1.7 in.	Induced 4.5 in.	Induced 2.3 in.	Induced ...
Shell Diameter (ft.)	16 ft.	14 ft. 6 in.	Oval 14 ft 2 in. x 12 ft. 8 in.	11 ft.
Shaft Dimension in Burning Zone.	6 ft. x 12 ft. 72 sq. ft.	6 ft. x 10 ft. 58 sq. ft.	6 ft. x 10 ft. 8 in. 60 sq. ft.	6 ft. x 7 ft. 6 in. 40 sq. ft.
Cooler Depth	15 ft.	15.5 ft.	15 ft.	15 ft.
Shaft Height	43 ft.	44 ft.	37 ft.	35 ft.
Storage Zone Height	16 ft.	16 ft.	14.5 ft.	17 ft.
Total Acting Kiln Height	74 ft.	75.5 ft.	66.5 ft.	67 ft.
Cooler Space (cu. ft.)	870	700	850	500
Shaft Space (cu. ft.)	3100	2550	2220	1453
Storage Zone Space (cu. ft.)	2400	2100	1950	1200
Total Kiln Space (cu. ft.)	6370	5350	5020	3153
Kiln Mass Above Foundation (cu. ft.)	14100	11500	8340	5660
Lime per day, sq. ft. of shaft area —lb.	1670	1720	1830	1500
Lime per day, cu. ft. of Shaft Space—lb.	38.7	39.2	49.5	41.3
Lime per day, cu. ft. Kiln Space —lb.	18.8	18.7	21.9	19.2
Lime per day, cu. ft. Kiln Mass	8.5	8.7	13.2	10.6
Cooler (Tons Equiv. Lime)	33	19	23	13
Shaft (Tons Equiv. Lime)	85	70	61	39
Storage (Tons Gross)	66	57	53	33
Total Kiln Space (Tons of Lime)	174	146	137	85

The tabulation shows how kilns should be evaluated and the performance of one contrasted with another, thereby setting up a standard of good performance for which to aim. There are many utterly silly kilns built because the designer had a poor perspective over the field and therefore lacked a high standard of aim. Of course his intentions may all have been good, and he may have been certain that he was accomplishing the notable. The mistake he made was that he was certain of himself; lime burning in the highest state of perfection would keep the best of minds engaged on the problem.

*Part of a paper delivered at the 19th annual convention of the National Lime Association, Chicago, Ill., May 12, 1937.

We Want to Know About Operating Results

IN THE AUGUST issue of ROCK PRODUCTS an article appeared about the F. L. Smidth kilns at H. E. Millard's Lime Plant which was a masterful description of equipment but lacked almost entirely information about the results obtained. Nothing at all could be found concerning capacity or fuel ratio which are really the factors that justify investment. There are altogether too many articles appearing that give generalities, but lack the most essential data. Readers have the right to expect that the operating results be published along with the plant description. The publication of the plant description without the essential operating data only goads

them on to spending their money; it often leads them into reckless, unjustifiable expenditures that bear scant return.

Recently several long rotary lime kilns were placed in operation, but so far no authoritative information as to their actual and reliable performance has appeared. The Mathieson kilns at Lake Charles are reported as giving very good results, but oyster shells are not the same thing at all in shape as limestone, so that plant and its results should not be considered as typical.

Information has come to the writer that Millard was guaranteed a ratio of 5 to 1 with 14000 B. t. u. coal for his new rotary plant. This is a remarkable ratio, but do they get it? The article does not touch on it anywhere.

The article gives the gas analysis as 30 per cent CO_2, but it does not mention oxygen; that would permit estimating full ratio so again gas analysis means nothing. It also states that stack temperature is 700 deg. F., which the writer doubts. It may be that the pyrometer registers this temperature, but that does not mean anything at all.

It is also stated that lime is cooled from 2300 to 150 deg. F. and air preheated to 800 deg. F. What happened to the rest of the heat in the lime? Air preheat accounts for only a small part of it, except that the ratio is very low. No rotary or vertical kiln that preheats primary air to only 165 deg. F., and secondary air to 800 deg. F., can ever obtain a ratio of 5 to 1 with high calcium lime.

With the interest shown in long rotary kilns and in pulverized coal, the equipment manufacturers should see to it that the lime men obtain some reliable data on true performance of the equipment, fuel ratio, capacity, quality of product, life of equipment, and something about cost and return on investment. The lime business is extremely competitive, and is getting more so, and a dollar invested will have to bear substantial returns or it may be that many dollars will be wasted.

Promoting Lime Plant

West Virginia Farm Bureau lime committee is trying to promote a $200,000 lime and stone plant to provide agricultural lime to farmers in 35 central counties of the state. Leland Booth, Morganstown, is secretary. He quoted F. B. Bomberger, president of the Baltimore Bank of Coöperatives, as willing to finance 60 per cent of the cost.

Limestone Products

Victorville Limerock Co., Victorville, Calif., has built up an industry supplying 2000 tons a month of special limestone products, including finely pulverized stone for paint and putty manufacturers, 20-mesh stone for the glass industry, poultry grits, etc. New equipment was recently installed to increase capacity.

Limestone Sand

Radford Limestone Co., East Radford, Va., has recently installed a 6- x 10-ft. Allis-Chalmers rod mill for making limestone sand from 1-in. size stone. The mill is driven by a Texrope drive through Wuest gears. It is the first mill of its kind to be used for making limestone sand.

New Operation

Savannah Stone Co., Savannah, Mo., has leased the Gee quarry and is producing agricultural limestone. Jack Dorsey, Kansas City, is superintendent.

Lime Marl

Carl Welton, Keyser, W. Va., is opening a plant at Petersburg Gap to to prepare lime marl for agricultural purposes.

Lime Dust

United States Lime Products Corp., San Francisco, Calif., is being sued for $20,000 by a local farmer near its Sonora, Calif., plant for alleged injury to crops by lime and limestone dust. In most parts of the country, farmers, are buying this fertilizer, but here is one who doesn't want it, or sees a chance to make some easy money.

Buys Gypsum Deposit

Southwestern Portland Cement Co., Los Angeles, Calif., has purchased a gypsum mine near Finlay, Tex., to supply gypsum to its El Paso, Tex., plant.

Power Contract Transferred

Volunteer Portland Cement Co., Knoxville, Tenn., which has a contract with the TVA to supply its power, is to have its contract assigned by TVA to the city of Knoxville. The city manager says the city will make $600 to $800 a month by buying power "wholesale" from TVA and retailing it to the cement company. The power is reputed to be sold now for less than cost to the cement company, so taxpayers in the U. S. A. will be subsidizing the city of Knoxville in addition.

Increased Capacity

A. A. Gonce Lime Co., Anderson, Tenn., has recently added new equipment to produce very finely pulverized limestone, which is said to be selling for $6.50 to $30 per ton. The company's limestone is said to analyze 98.58 per cent calcium carbonate.

Sand-Lime Brick Production and Shipments

The following data are compiled from reports received direct from producers of sand-lime brick located in various parts of the United States. They may be considered representative of the industry.

Ten active sand-lime brick plants reported for the month of August and nine active plants reported for the month of July, statistics for which were published in September.

Average Prices for August

Shipping Point	Plant Price	Delivered Price
Sioux Falls, S. D.	$12.00	$13.50
Detroit, Mich.	....	16.00
Pontiac, Mich.	12.50	15.00
Mishawaka, Ind.	9.50	....
Watertown, Mass.	12.50	13.50
Syracuse, N. Y.	14.00	16.00 C.L. 20.00 L.C.L.
Minneapolis, Minn.	9.50	11.50
Grand Rapids, Mich.	10.50	13.50

Statistics for July and August

	July†	August*
Production	3,177,050	3,821,985
Shipments (rail)	412,000	616,200
Shipments (truck)	2,643,417	2,961,590
Stock on hand	2,940,912	2,390,000
Unfilled orders	1,024,588	3,397,114

† Nine plants reporting; incomplete, three not reporting unfilled orders.

* Twelve plants reporting; incomplete, five not reporting unfilled orders.

To Add Capacity

Vermont Associated Lime Industries, Inc., Leicester Junction, Vt., H. B. Huntley, vice-president and treasurer, is reported to be planning erection of three additional lime kilns. Demand for chemical lime is said to exceed present capacity of three existing vertical kilns.

Paper-Mill Lime

Southern Kraft Co., Springfield, La., is installing an 11 ft. x 250-ft. Allis-Chalmers rotary kiln to burn lime for its new kraft paper plant.

Beg Your Pardon!

A correction in the Chemists' Corner. A typographical error has been called to our attention by the author. In the September issue on page 60, column 2, fifth line from the bottom now reads: $C_3S=50\%$; $C_2S=19\%$; $C_3A=19\%$; it should read $C_3S=50\%$; $C_2S=19\%$; $C_3A=16\%$.

Belt Conveyor Involved in Fatal Accident

Carries a Lesson

ANOTHER NEEDLESS FATAL ACCIDENT which occurred within a few weeks in one of the cement mills is related here in the hope that the story may help to prevent recurrence of this mishap.

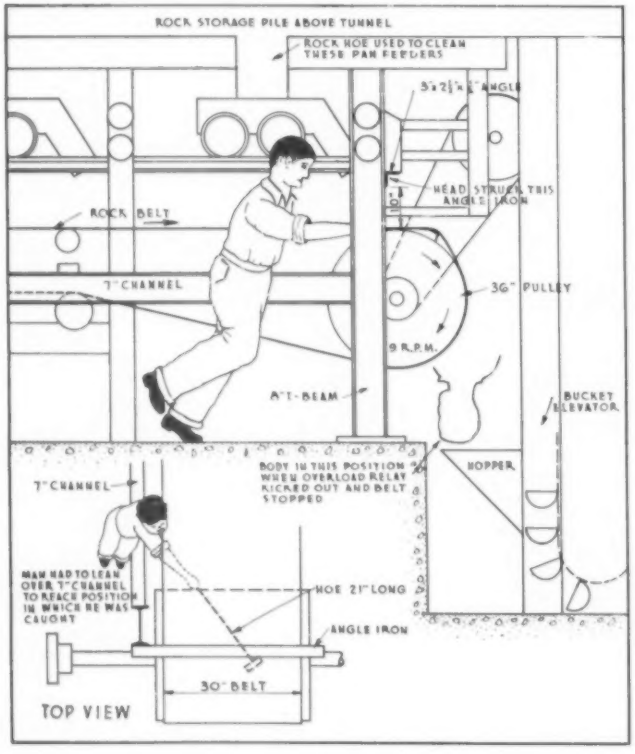
A rock tunnel operator who had held this position for three months, previously having been extra man in the rock tunnel for about three years, was the victim. Rock is removed from tank hoppers feeding into the tunnel and onto a belt conveyor. The belt is operated by a 5 h.p. motor with speed reducer.

The victim's right hand was caught between the belt and the drive pulley, and he was pulled forward sharply, so that his head struck an angle iron brace located about 10 in. above the pulley. The skull was crushed above the eyes, causing immediate death. In the accompanying sketch is shown how the accident happened. There were no eye witnesses, but the circumstances are not difficult to reconstruct.

Safe Training Disregarded

The foreman and older employes had instructed the victim, demonstrating safe methods of performing all the details of his work. This had included the cleaning of the trough and return belt idlers. It had never been found necessary to clean the drive pulley. Although no operator had ever been instructed to clean the latter, the victim, when found, had clutched in his hand a small iron hoe with a handle 21 in. long, which he seemed to have been trying to use as a scraper on the drive pulley. The tunnel was clean, dry and efficiently lighted.

Was the deceased "playing" with the hoe, rubbing it on the pulley face, while his thoughts strayed? The hoe was intended only for cleaning clogged rock from pan feeders.



Showing how rock tunnel operator met with a fatal accident by carelessness in allowing his hand to be caught between conveyor belt and drive pulley

Was the slow speed of the belt (pulley turning only 9 r.p.m.) deceptive? Did it invite idle tampering? Why did he hold onto the hoe so long that his hand and arm were caught?

Is it not probable that the slow speed of this drive pulley and belt made it look safe without a guard so arranged that it would have been impossible for a man to get caught? Those in charge of supervision were careful to try to teach the victim safe operation, but still could not conceive that anyone would get into this drive pulley.

Guard All "Nip" Points

Experience has shown that even in such cases unfailing provision must be made to keep operators at a safe distance from drive pulleys. "Nip" points of all belts, pulleys, chain and rope drives within 7 ft. of the floor should be protected. A complete check up should be made in all plants to make sure that this suggestion is followed.

Of course, it is evident that the well-intentioned safety instruction failed to impress this victim.

What One Foreman Told His Men

The following message to his men from Andrew Hounslow, a foreman of the Agfa Ansco Corp., drives home a lesson with straight-from-the-shoulder realism. Not content to say vaguely, "Think of the consequences," Mr. Hounslow pictures plainly the consequences of tangling with machinery:

"Suppose you decide to take a chance at cleaning a machine in motion. Everything is going smoothly, and suddenly the cloth (tool?) which you are using is caught between two revolving rollers. Maybe the cloth is wound around your hand, or maybe you just try to snatch it out of the rollers, a natural reaction. The results are the same. Before you can think it over, you feel the sharp, intense pain in your finger tips and know that you're caught. A quick pull and your fingers, what's left of them, are free—if the pull is quick enough. The Doc will fix up the mashed digits with clips and things which you don't

feel at all because by that time the numbness, which set in immediately after the first shock of pain, begins to wear off, and nothing can beat the feeling that takes its place.

"If you're lucky, you get out of it with the loss of a few nights' sleep and a few days' work, some scarred and stiff fingers and the experience. But that's not always the case. Frequently infection sets in. Then they just cut off the infected and rotting parts, and you can keep what's left.

"Now let's suppose you don't get your fingers out quickly enough. They are followed by the hand, wrist and maybe forearm before you yourself or somebody with you stops the machine. If you're made of good tough material, you stand there for what will probably seem like hours, waiting for your fellow workers to get you out. If the rollers in which you are caught are in such a position that they cannot be pried apart with a crowbar then they must be turned backward to effect your release.

"That's when the fun begins. You want to yell or scream or something, but you remember that you're a man and try not to. It wouldn't help the fellows around you any. They would probably be feeling pretty sick about that time, and look it. You feel empty inside and hot all over, especially your stomach. Maybe like standing a little too close to hell.

"Finally you're out. You don't look at the hand if you can help it. You don't feel like reminding yourself of the way it looks—not any.

"And so to bed—in the hospital—for weeks, possibly months. Your arm becomes a pin-cushion for hypo needles, so you can sleep nights and won't go crazy with pain. There'll be lots of time to contemplate the error of your ways and make resolutions concerning future conduct near machinery. I might add that you may not get a job near machines if and when you return to work. The management doesn't like the red marks that accidents make on the safety record.

"After the hospital comes the job of restoring the injured appendage to usefulness. It will, if you still have it, be pretty stiff. A year or so of massage and electrical treatment and maybe you'll find a use for it."

Building Employe's Goodwill

MONOLITH PORTLAND CEMENT CO., Monolith, Calif, recently was host to 100 children for a week's vacation on Catalina Island. The children were those of the company's employes—7 to 14 years old. The idea originated with Coy Burnett, president of the company.

Phosphate Strike Settled

COLUMBIA, TENN.: The C.I.O. strike which has had the plant of the Federal Chemical Co., Ridley, tied up since May, and that of the International Agricultural Corp., Mt. Pleasant, for the same time, until August 23, was finally settled by consent decree of the chancery court on August 27, and full operations are already under way at the International plant and were resumed at the Federal plant as soon as the needed repairs and tuning up after the long shut down were made.

The only issue between the two sides was signing a contract with C.I.O., as both companies were offering to pay higher wage scales than the union had stipulated in the other plants which made agreements. The apparently insurmountable difficulty was overcome, and "the wooden handle welded to the pewter spoon," by the companies obtaining temporary injunctions from the court against union interference with their men who wanted to return to work, and this injunction was finally incorporated in a consent decree, carrying all rights and desires of both parties, without the necessity of signing a contract. Thus "face" has been preserved on both sides and the pitiful spectacle of nearly four hundred men who had no real grievance, continuing to lose good working time, after three months' loss of the best working time of the year, is ended.

Holdings Increased

Supplementing recent purchases of property from the TVA, the Monsanto Chemical Co., recently took over from Frank Alderson and Marion Sheddan tract of about 120 acres for $50,000.00, which joins the Monsanto property and had been under an option contract to TVA.

The construction and installation work at the plant of National Carbon Works at Columbia is about completed and regular operations were planned to begin early in September.

Monsanto has several hundred thousand tons mined and in storage at the washer and sintering plants to provide against bad weather conditions of winter and spring.

TVA mining on the Akin property for shipment to Muscle Shoals, and on the Sharp place for delivery to the Monsanto plant, is proceeding with utmost activity while good weather lasts.

Producing Phosphorus

The marvel of daily shipment of three tank cars of elemental phosphorus from Monsanto to Anniston continues and is now a matter of ordinary routine. Only one serious accident has occurred with this dangerous material, and that was happily at the plant where it could be promptly handled.

Victor Chemical Works has let its contract for the million dollar phosphorus plant at Mt. Pleasant to Stone & Webster who have sublet foundations and preliminary construction to Haley & Co., whose work is now rapidly under way.

Ground Rock

Regular withdrawals against contract in fertilizer manufacturing lines are proceeding, shipments to Victor at Nashville are in full movement, and orders for direct application of ground rock are being filled at a rapid rate by all producers in that line. Shipments are again moving with great speed, and even the strikers who have gone without work for three months are glad to again get in the fashion by going to work.

The phenomenal building boom at Columbia continues, and building has even started at Mt. Pleasant, where for five or six years supply of housing facilities far exceeded the demand due to depression in the phosphate industry.

Hoover & Mason are installing their new washer and will soon be in shape to supply the same high grade product from all classes of deposits, which they have been producing from their virgin deposits for 25 years.

Wins Safety Award

For operating throughout 1936 without a disabling injury, the Hudson, N. Y., plant of the Universal Atlas Cement Co. was awarded the Portland Cement Association's safety trophy. Dedication exercises were held at the plant on September 25. The Waco, Tex., plant of the same company, with the same record, will dedicate its trophy October 9.

Presentation of the Hudson trophy was made by A. J. Curtis, assistant to general manager, Portland Cement Association, and accepted by M. J. Degnan, safety supervisor of the Hudson plant. About 2,000 people were present. The address of the day was made by Jack Dempster, director of safety, Canada Cement Company, Ltd. Other addresses were given by P. C. Van Zandt, vice-president, Universal Atlas, and R. A. Dittmar, Hudson plant superintendent. G. H. Reiter, vice-president of the company, S. J. Robison, chief engineer, and B. J. Whittaker, district sales manager, Albany, were among the visitors present.

All nine of the company's plants have now won the association's safety trophy one or more times, according to Gordon C. Huth, assistant manager, industrial relations, for the cement concern.

Recent Quotations on Rock Products Securities

Stock	Date	Bid	Asked	Dividends	
Aetna P. C., cap.[51]	9-27-37	22	..		
Allentown P. C. (Penn.), com.[51]	8-24-37	6	..		
Allentown P. C. (Penn.), 6% cum. pfd.[51]	9-27-37	9½	..		
Alpha P. C., com.	9-23-37	17¾	20½	.25	Sept. 25
American Aggregates, 1st mtg., 3/6's 1943, new bonds[48]	9-15-37	75	..		
American Aggregates, 6's 1943, old[48]	9-15-37	75	..		
American Aggregates, com.[48]	9-15-37	2	3		
American Aggregates, pfd.[48]	9-15-37	20	..		
Arundel Corp., com.	9-23-37	18⅞	..		
Ash Grove L. & P. C., com.[51]	9-27-37	11½	..		
Ash Grove L. & P. C., pfd.[51]	9-27-37	94	..		
Basic Dolomite, Inc.			..	.20	Sept. 15
Bessemer L. & C., com.[48]	9-15-37	6	7½		
Bessemer L. & C., pfd[48]	9-15-37	26	..		
Bessemer L. & C., 6½'s, 1955[51]	9-27-37	95	96		
Boston S. & G., com.[37]	9-15-37	1¼	2½		
Boston S. & G., 7% pfd.[37]	9-15-37	8	12		
Boston S. & G., 7's 1939[37]	9-15-37	80	..		
Calaveras Cement, com.[40]	9-20-37	5	8		
Calaveras Cement, 7% pfd.[40]	9-20-37	75	92	2.00	Sept. 30
California Art Tile, A[9]	9-16-37	15½	16½	1.50	Sept. 1
California Art Tile, B[9]	9-16-37	2	5		
Canada Cement, com.[42]	9-24-37	10½	10⅝		
Canada Cement, pfd.[42]	9-24-37	102¾	103½	1.25	Sept. 20
Canada Cement, 4¼'s, 1951[42]	9-24-37	99	100½		
Canada Crushed Stone, 5½'s, 1944[42]	9-24-37	99½	100		
Carolina P. C., 8% cum. pfd.[51]	8-24-37	42	..		
Consol. Cement, A[51]	9-27-37	3½	6		
Consol. Cement, 1st 6's 1950[50]	9-18-37	79	81		
Consol. Okla. S. & G., 6½'s 1948[42]	9-24-37	25	30		
Consol. S. & G. pfd.					
Consol. Rock Products, units[50]	9-18-37	½	1½		
Consumers R. & G. 1st Mtg., 6's 1948[51]	8-24-37	35½	38½		
Coosa P. C., 1st 6's[51]	9-27-37	58	..		
Coplay Cement Mfg., pfd.[50]	9-18-37	14	18		
Coplay Cement Mfg., 6's 1941[50]	9-18-37	92	..		
Cumberland P. C., units[51]	9-27-37	42	..		
Cumberland P. C., 7's, 1937[51]					
Dewey P C., com. (new)[51]	9-27-37	23½	26½		
Diamond P. C.[26]	8-14-37	15¼	16	.25	July 20
Dolese & Shepard	8-25-37	39	42		
Federal P. C., 5's 1947[51]	8-24-37	62	..		
Federal P. C., 6½'s 1941[48]	9-15-37	62F	..		
Fla. P. C., units[50]	9-18-37	27	30		
Fla. P. C., 6½'s 1937[46]	9-18-37	100	..		
Giant P. C., com.[50]	9-18-37	2	3		
Giant P. C., pfd.[50]	9-18-37	12	14		
Glens Falls P. C., com.[51]	9-27-37	12	16		
Glens Falls P. C., pfd.[51]	8-24-37	86	92		
Great Lakes P. C. B[51]	9-27-37	½	..		
Gyp., Lime & Alabastine	9-23-37	8	9¼		
Gyp., Lime & Alabastine, 5½'s, 1948[42]	9-24-37	101¼	102		
Hercules Cement, com.[51]	9-27-37	44	..		
Hermitage P. C., com.[51]					
Hermitage P. C., pfd.[51]					
Ideal Cement, com.[50]	9-18-37	24	25½	.50	Sept. 30
Kelley Island L. & T.	9-28-37	21½	23		
Ky. Rock Asphalt, 6½'s, 1936[46]	9-18-37	30	35		
Ky. Stone Co., v.t.c.[46]	9-18-37	5	..		
Ky. Stone Co., 5% 1956[46]	9-18-37	50	..		
Keystone P. C., pfd.[51]	9-27-37	30	..		
Lawrence P. C., com.	9-23-37	21	24		
Lawrence P. C., 5½'s, 1942[50]	9-18-37	100	..		
Lehigh P. C., com.	9-23-37	21½	23	.37½	Nov. 1
Lehigh P. C., 4% pfd.	9-23-37	107	111	1.00	Oct. 1
Lone Star Cement, com.	9-23-37	37	38		
Louisville Cement	9-29-37	40	44		
Lyman-Richey, 1st 6's, 1939-40[51]	8-24-37	38	..		
Marbelite Corp., com.[40]	9-20-37	35	..		
Marbelite Corp., pfd.[40]	9-20-37	4	5		
Marblehead Lime, 7's, 1944[14]	9-15-37	85	90		
Marquette Cement, com.	8-25-37	43	44		
Marquette Cement, pfd.[50]	9-18-37	103	106		
Material Service Corp.[50]	9-18-37	17	18		
McCrady-Rodgers, com.[50]	9-18-37	6	8		
McCrady-Rodgers, 7% pfd.[50]	9-18-37	30	37		
Medusa P. C., com.	9-28-37	24	26		
Medusa P. C., 6% cum. pfd.[51]	9-27-37	98	102	1.50	Oct. 1
Michigan L. & C., com.[51]					
Minnesota Mining & Mfg. Co.	8-25-37	36¼	39		
Missouri P. C.	9-23-37	14¾	..		
Monarch Cement, cap.[51]	9-27-37	97	..		
Monolith P. C., com.[9]	9-27-37	3¼	4	4%	July 1
Monolith P. C., 8% pfd.[9]	9-16-37	7¼	8¼	.25	Aug. 15
Monolith P. C., 1st mtg.[9]					
Monolith Portland Midwest, pfd.[9]	9-16-37	3¼	4		
National Gypsum, A., com.	9-23-37	8¾	9		
National Gypsum, 7% pfd.				1.75	Oct. 1
National Gypsum, 5% pfd.	8-25-37	16½	18	.25	Oct. 1
National L. & S., 6½'s, 1941[46]	9-18-37	90	..		
Nazareth Cement, com.[50]	9-18-37	..	10		
Nazareth Cement, 7%, pfd.[50]	9-18-37	90	..		
Newaygo P. C., pfd.[51]	9-27-37	90	..		
New England Lime, units[34]	9-15-37	18	20		
N. Y. Trap Rock, 7% pfd.[46]	9-18-37	40	..		
North Amer. Cement, 6½'s, 1953[50]	9-18-37	47	51		
North Amer. Cement "A" pfd.[50]	9-18-37	4	8½		
North Amer. Cement, com. A[50]	9-18-37	..	6		
North Amer. Cement, 6½'s, 1940[50]	9-18-37	80	..		
North Amer. Cement, 6½'s, 1943[50]	9-18-37	90	..		
North Amer. Cement "B" pfd.[50]	9-18-37	8	12		
North Shore Mat., 1st 6's[50]	9-18-37	48	..		
Northwestern P. C., units[9]					
Northwestern P. C., pfd.				1.00	Sept. 25
Northwestern States P. C.[50]	9-18-37	26	29		
Ohio River S. & G., com.	8-25-37	1	..		
Ohio River S. & G., 1st pfd.	9-29-37	79	..		
Ohio River S. & G., 2nd pfd.	9-29-37	5	..		
Ohio River S. & G., 6's[46]	9-18-37	10	..		
Oregon P. C., com.[40]	9-20-37	—	4		
Oregon P. C., 1st pfd.[40]	9-20-37	98	..		
Oregon P. C., conv. pfd.[50]	9-18-37	50	55		
Pacific Coast Aggr., new com.[40]	9-20-37	2.10	2.25		
Pacific Coast Cement, com.[51]					
Pacific Coast Cement, 1st pfd.[51]	9-27-37	43	..		
Pacific P. C., com.[40]	9-20-37	2	4		
Pacific P. C., pfd.[40]	9-20-37	48	52		
Peerless Cement, com.[50]	8-17-37	4½	5½		
Penn.-Dixie Cement., com.	9-23-37	5	5¼		
Penn.-Dixie Cement, pfd. A					
Penn.-Dixie Cement, 6's A, 1941					
Penn. Glass Sand Corp., v.t.c.	9-23-37	19	20	.25	Oct. 1
Penn. Glass Sand Corp., pfd.[51]				1.75	Oct. 1
Petoskey P. C., com.[51]	9-27-37	7¾	8½		
Republic P. C., com.[51]	9-27-37	8	9		
Riverside Cement, A[9]	9-16-37	13	15		
Riverside Cement, B[9]	9-16-37	3	4		
Riverside Cement, pfd.[40]	9-20-37	93	96		
Rockland & Rockport Lime, com.[51]					
Santa Cruz P. C., pfd.[9]	9-16-37	33	34		
Schumacher Wallboard, com.[9]					
Schumacher Wallboard, pfd.[9]	9-16-37	19	21		
Signal Mt. P. C., com.[50]	9-18-37	2	3½		
Signal Mt. P. C., pfd.[50]	9-18-37	..	74½		
Signal Mt. P. C., units[51]	9-27-37	66	70		
Southern States P. C., cap.[51]	9-27-37	42	..		
Southwestern P. C., units[40]	9-20-37	190	..		
Spokane P. C., units					
Standard Pav. & Mat., com.[42]	9-24-37	2⅞	3¼		
Standard Pav. & Mat., pfd.[42]	9-24-37	22	24		
Standard Silica				.20	Sept. 15
Superior P. C., pfd.				.27½	Sept. 1
Superior P. C., A[40]	9-20-37	40	45	.27½	Sept. 1
Superior P. C., B[40]	9-20-37	15½	18	.27½	Sept. 1
Trinity P. C., units[50]	9-18-37	83	..		
U. S. Gypsum, com.	9-23-37	81¼	83½	.50	Oct. 1
U. S. Gypsum, pfd.	9-23-37	154¾	161	1.75	Oct. 1
Volunteer P. C., 1st 7's, 1942[46]	8-18-37	96½	..		
Volunteer P. C., units[46]	9-18-37	75	..		
Vulcanite P. C., com.[48]	9-15-37	8	10½		
Vulcanite P. C., 7½'s, 1943[46]	9-18-37	99½	..		
Wabash P. C.[50]	9-18-37	12	..		
Warner Co., ww. 1st 6's, 1944[46]	9-18-37	78	81		
Warner Co., com.[50]	9-18-37	5	8		
Warner Co., pfd.[50]	9-18-37	10	15		
Whitehall Cement Mfg., com.[34]	9-27-37	80	90		
Whitehall Cement Mfg., pfd.[51]					
Wisconsin L. & C., 1st 7's, 1940[14]	9-15-37	90	..		
Wolverine P. C., com.					
Yosemite P. C., 4% pfd.[40]	9-20-37	3½	4	.10	Oct. 1

Quotations by [9]A. E. White Co., San Francisco, Calif. [14]The Securities Co. of Milwaukee, Inc., Milwaukee, Wis. [37]Wise, Hobbs & Seaver, Inc., Boston. [40]Martin Judge Jr., and Co., San Francisco, Calif. [42]Nesbitt, Thomson & Co., Ltd., Toronto, Ont. [46]First National Bank of Chicago, Chicago, Ill. [48]Hewitt, Ladin & Co., New York, N. Y. [50]Rogers & Tracy, Inc., Chicago, Ill. [51]Paul D. Sheeline & Co., Boston, Mass. [26]Merrill, Turber & Co., Cleveland, Ohio.

RECENT DIVIDENDS ANNOUNCED

Basic Dolomite, Inc.	(Q)	$ .20	Sept. 15
Calaveres Cement Co. 7% pf.	Ac.	2.00	Sept. 30
Ideal Cement Co.		.50	Sept. 30
Lehigh Portland Cement Co. pf.	(Q)	1.00	Oct. 1
Medusa Portland Cement pf.	(Q)	1.50	Oct. 1
National Gypsum 1st pfd.	(Q)	1.75	Oct. 1
National Gypsum 2nd pfd.	(Q)	.25	Oct. 1
Northwestern Portland Cement Co. pf.		1.00	Sept. 25
Pennsylvania Glass Sand pf.	(Q)	1.75	Oct. 1
Standard Silica Corp.		.20	Sept. 15
Yosemite Portland Cement Corp.		.10	Oct. 1

BESSEMER LIMESTONE & CEMENT CO., Youngstown, Ohio, according to local newspaper reports, earned 42c a share on common for the first half of 1937. This compares with a loss of 12c per share for the corresponding period in 1936 and a net profit of 70c per share for the whole of 1936.

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STANDARD SILICA CORP., Chicago, Ill. stockholders voted recently to increase authorized capital stock from 40,000 shares of $10 par value to 150,000 shares $1 par value. Existing shares were split 3 for 1 and a regular quarterly dividend of 20c per share was declared payable, September 15, to holders of record, September 1, payable in either stock or cash, at the holder's option, upon the basis of $5 per share for the new stock.

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UNITED STATES GYPSUM CO., Chicago, Ill., reports for the six months ended June 30:

	1937	1936
Operating profit	$4,967,373	$3,483,666
Other income	164,056	210,880
Total income	5,131,429	3,694,546
Depreciation and depletion	1,086,764	1,009,394
Miscellaneous deductions	33,412	30,492
Income taxes	573,000	412,886
Federal surtax	37,000	.....
Net income	3,401,253	2,241,774
Preferred dividends	273,777	273,777
Common dividends	1,193,156	894,077
Surplus for period	1,934,320	1,073,920
Earned per share, preferred	$43.48	$28.66

Indicated net working capital at June 30 had declined $985,000 from a year earlier. Current assets totaled $22,722,817 at June 30, including $5,505,553 cash, $3,684,805 of marketable securities and $6,571,131 of inventories. Current liabilities amounted to $4,184,619, leaving an indicated net working capital of $18,538,198. A year earlier current assets were $22,915,030, including $8,333,997 cash, $4,555,472 marketable securities and $4,618,403 of inventories. Current liabilities totaled $3,392,000, leaving net working capital of $19,523,030.

Earned surplus was $23,702,766 at June 30, as compared with $21,638,142 at June 30, 1936.

PACIFIC COAST CEMENT CO., Seattle, Wash., whose plant is operated by Superior Portland Cement, Inc., under lease, reports for the years ended December 31:

	1936	1935
Gross earnings	$325,423	$181,770
Operating expense and taxes	33,595	67,948
Depreciation and depletion	106,287	108,319
Operating income	185,541	5,503
Other income	14,290	10,688
Total income	199,832	16,190
Bond interest	107,600	109,082
Other interest	14,221	12,177
Amortization of discount and expense	20,113	19,011
Other charges	*10,011	914
Net income	47,888	(d)124,994
Earned per share, preferred	$6.39	nil
Earned per share common	(d)0.05	(d)1.77
Times charges earned	1.41	0.11

*Income tax provision.

Current assets as of December 31, 1936, were reported to be $224,416 and current liabilities $37,648.

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PEERLESS CEMENT CORP., Detroit, Mich., reports for the six months ended June 30, 1937, earnings of $105,060 or $0.34 per share, against $42,980 or $0.14 per share for the same period in 1936.

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PACIFIC COAST AGGREGATES, INC., San Francisco, Calif., reports for the six months ended June 30:

	1937	1936
Sales revenue	$681,321	$474,573
Cost and operating expense	494,039	339,429
Selling and administration expense	86,077	76,382
Depreciation and depletion	89,568	79,843
Operating profit	11,637	(d)21,081
Other income	18,414	14,568
Total income	30,051	(d)6,513
Subsidiaries loss	(cr)17,427	8,612
Other deductions	8,490	9,804
Net profit	38,988	(d)24,931
Earned per share	$0.07	(d)$0.04
Number of shares	558,915	554,586

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HURON RIVER SILICA CO., Detroit, Mich., with plant at South Rockwood, Mich., a new enterprise, submitted the following balance sheet, as of April, 30:

Assets :	
Properties (incl. silica deposits, etc.)	$229,638
Furniture and equipment	565
Treasury stock	52,500
Cash	61,962
Advances	1,634
Total	$346,299
Liabilities:	
Common stock (par $1)	$272,892
Mortgages payable	31,338
Accounts, notes, etc., payable	3,711
Advances to stockholders	2,240
Accrued interest	1,472
Paid-in surplus	34,646
Total	$346,299

Authorized capital stock consists of 600,000 shares; of these 300,000 were offered the public, in Michigan only, at $1 (par).

Officers of the company are W. B. Mayor, chairman of the board; J. W. Drake, president; A. T. Pryor and H. L. Joseph, vice-president; W. F. Morgan-Dean, secretary; J. W. McDougal, treasurer.

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ABERENE STONE CORP. OF VIRGINIA, Schuyler, Va., (talc and soapstone) reports for the six months ended June 30:

Net sales	$301,031	$184,432
Cost of sales	176,641	114,006
Selling, general and administration expense	61,381	42,844
Depreciation and depletion	14,026	12,168
Taxes	4,260	5,425
Net earnings	44,723	9,989
Other income	8,066	8,878
Total income	52,789	18,868
Interest	.....	200
*Net income	52,789	18,668
Earned per share	$0.79	$0.28

*Before Federal taxes.

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STANDARD SILICA CORP., Chicago, Ill., reports for the six months ended June 30, a profit of $61,255, or $1.56 per share (old common) against $26,177 or $0.67 for the same period in 1936. Current assets as of June 30, 1937, were $123,400 and current liabilities $23,077.

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ARUNDEL CORP., Baltimore, Md., sand, gravel and slag producer, and dredging contractor, had net profit for the first eight months of 1937 of $850,336, compared with $470,859 last year. New contracts received since June 30, according to Joseph B. Hogan, president, totaled $425,100, and contract work on hand is approximately $8,500,000.

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PENNSYLVANIA GLASS SAND CORP., Lewistown, Penn., and subsidiaries report a net profit of $225,057 for the quarter ended June 30 after depreciation, depletion, interest and federal income taxes but before the surtax on undistributed profits, equal, after the quarterly dividend requirements on 25,882 shares of $7 preferred, to 56c a share on $320,590 shares common, against $175,264, or 40c a common share, in the preceding quarter. For the six months ended June 30 the net profit was $400,321 compared to $191,165 in the first half of 1936.

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New Owner

FULLER CO., Wauwatosa, Wis., has taken over the quarry, crushing plant and ready-mixed concrete plant of G. D. Francey Coal & Supply Co., and the Certified Concrete Co., Wauwatosa. S. L. Fuller is proprietor.

New Plant

M. O. WEAVER, Cedar Rapids, Ia., has opened a quarry east of Marshalltown, Ia., to supply crushed stone to the G. G. Herrick Co., Des Moines, contractor for concrete paving on Highway 88.

TRAFFIC and TRANSPORTATION

Proposed Rate Changes

THE FOLLOWING are the latest proposed changes in freight rates up to and including the week of September 18:

Trunk

3339-17. **Stone, crushed,** coated with oil, tar or asphaltum (known as amiesite or carbo rock); **gravel** and/or **sand,** coated or treated with oil, tar or asphaltum, C. L., Chicago to Belleville, Ill. Present, class; proposed, $2.68 net ton.

7601-G. To cancel rate of $1.90 per net ton to Marseilles, Ill., and rate of $2.15 per net ton to Waukegan, Ill., from Danville, Ill., on **roofing granules,** consisting of **brick, slate, gravel** or **stone, crushed** or **ground,** min. wt. 60,000 lb., as published in Item 1500 of I. F. A. Tariff 37-A to apply in lieu thereof. Also, to cancel rate of $1.51 per net ton on roofing granules consisting of crushed stone from Danville, Ill., to Joliet, Ill., published by N. Y. C. R. R., permitting the application of Item 1505-B of I. F. A. Tariff 37-A to apply in lieu thereof.

Sup. 1 to 36168. **Crude Dolomite,** C. L., (See Note 3), from Millville, W. Va., to Buffalo, N. Y., $1.47 per gross ton, in lieu of present Sixth Class rate of 28c per 100 lb.

36191. **Limestone,** crushed, only in open top equipment, C. L. (See Note 3), from Greer, W. Va., to Grantsville, Md., $1.40 per net ton, in lieu of present class rate.

36225. **Crushed stone** and **screenings,** in straight or mixed carloads (will not include agricultural limestone or ground limestone, unburnt, fluxing stone or firestone or stone, coated with oil, tar or asphaltum), from Wertz, Penn., to Burnside, Penn., $1.20 per net ton, in lieu of present Sixth Class rate of 14c per 100 lb. Reason: Based on Lycoming scale for joint haul.

36228. **Lime,** common, hydrated, quick or slaked and dry building mortar, C. L., min. wt., 30,000 lb., and on **lime,** common, hydrated, quick or slaked, C. L., min. wt., 50,000 lb., from various points in W. Va., Md. and Penn. to various New York State points on the D. & N. R. R., rates ranging from $3.20 to $4.20 per net ton, in lieu of present combinations.

Sup. 1 to 36228. **Lime,** common, hydrated, quick or slaked, and **dry building mortar,** C. L., min. wt. 30,000 lb., and lime, common, hydrated, quick or slaked, C. L., min. wt. 50,000 lb., to points in New York state on the D. & N. R. R. from stations on the Reading Co. shown under Group 2 in Reading Co. I. C. C. 1616, $3.60 and $3 per net ton, respectively; from Buffalo and East Buffalo, N. Y., $4.20 and $3.50 per net ton, respectively; from Strasburg, Va., Group, $4.30 and $3.60 per net ton, respectively; from Staunton, Va., Group, $4.70 and $3.90 per net ton, respectively; and from Chambersburg, Penn., Group, $4 and $3.30 per net ton, respectively; in lieu of present rates.

36230. To cancel commodity rates on **lime,** common, hydrated, quick or slaked and dry building mortar, C. L., **limestone,** ground or pulverized and stone dust, C. L., from Avis, Penn., Mill Hall, Penn., and Jersey Shore, Penn., to all points in Trunk Line, New England and C. F. A. territories as published in N. Y. C. R. R. Tariff I. C. C. N. Y. C. 16883, P. R. R. I. C. C. 1355, P. R. R. I. C. C. 1667 and W. S. Curlett's I. C. C. A-520. Reason: No present or prospective movement.

36231. **Limestone,** broken, crushed, ground or pulverized, C. L., min. wt. 60,000 lb., from Natural Bridge, N. Y., to Dillsburg, Alexandria, Penn., $2.65, and Everett, Penn., $2.75 per net ton, in lieu of present Sixth Class rates.

36242. **Fluxing lime,** having no commercial value for chemical or building purposes, C. L., min. wt. 60,000 lb., from Annville, Penn., to Clairton, Donora, Homestead, McKeesport, Monessen and Pittsburgh, Penn., $2.10 per net ton, in lieu of present rates.

36257. **Stone,** natural, crushed, C. L. (See Note 1), from Nazareth, Penn., to Manville, N. J., $1 per net ton, in lieu of present rate $1.75.

36279. On **sand,** common, or building (not industrial), C. L. (See Note 3), from Lacona, N. Y., to Montour Falls, N. Y., $1.50 per net ton in lieu of present 6th class rate. Reason: Based on Lycoming Scale for joint haul.

36286—**Plaster** and related articles, and **plasterboard,** C. L., min. wt. 40,000 lb., as described in B. & O. R. R. Tariff I. C. C. 7972 (B. R. & P. Ry. series), from Garbutt and Wheatland, N. Y., to Bridgewater, Va., 23½c per 100 lb. on plaster and related articles, and 26c per 100 lb. on plasterboard, in lieu of present 6th class rates.

36288. **Crushed stone,** C. L. (See Note 3) from Reading, Penn., to Shenandoah, Penn., $1.10 per net ton, in lieu of present Sixth Class rate 13c per 100 lb.

Central

51858. To establish on **sand,** industrial, C. L., (See Note 3), but orders will not be accepted for closed cars of less marked capacity than 60,000 lb., nor for open top cars of less marked capacity than 80,000 lb. (see note), from Copley, O., to Chippawa, Ont., 287c per net ton. Note—When the shipper orders a car of above mentioned marked capacities or greater, and the carrier is unable to furnish car ordered and furnishes a car of greater capacity than that ordered, the min. wt. for the car furnished will be that which would have obtained had the car ordered been furnished and used. Route—The proposed rate to apply only via Black Rock or Suspension Bridge, N. Y., except in connection with T. H. & B. Ry., will also apply via Ashtabula Harbor, O., T. H. & B. Navigation Co., and Port Maitland, Ont.

51860. To establish on **plaster** and articles taking same rates, C. L., min. wt. 40,000 lb., from Grand Rapids, Mich., to North College Hill, O., 18c.

51870. To cancel rates on **lime,** common, hydrated, quick or slaked (except fluxing lime), in straight or mixed C. L., min. wt. 30,000 lb., and **lime, agricultural,** common, fluxing, hydrated, quick or slaked, in straight or mixed C. L., min. wt. 50,000 lb., from Marion, O., to various points in New York, Pennsylvania and West Virginia, published in Erie R. R. Tariff 156-I, and other individual lines' tariffs. Class rates to apply in lieu thereof.

51901. To establish on **sand** (other than industrial) and **gravel,** in open top equipment, C. L., (See Note 3), from Chardon, O., to Cleveland, 70c, Warren, 60c, and Youngstown, O., 85c per net ton. Route—To Cleveland, O., B. & O. R. R., Painesville, O., N. Y. C. & St. L. R. R.; to Warren, O., B. & O. R. R., direct; to Youngstown, O., B. & O. R. R., direct.

51902. To establish on **core sand,** C. L., (See Note 3), but orders will not be accepted for closed and open top cars of less marked capacity than 60,000 and 80,000 lb., respectively (see note), from Daytona (Black siding), Mich., to Cleveland, O., 200c in open top cars and 210c per net ton in closed cars. Note—When a shipper orders a car of above mentioned marked capacities or greater, and the carrier is unable to furnish car ordered and furnishes a car of greater capacity than that ordered, the min. wt. for the car furnished will be that which would have obtained had the car ordered been furnished and used.

51904. To establish on **stone, crushed, slag and/or gravel,** coated with oil, tar or asphaltum,* in open top equipment, C. L., from Charleston, W. Va., to Ripley, 160c, and Spencer, W. Va., 170c per net ton. Route—Via N. Y. C. R. R., Point Pleasant, W. Va., B. & O. R. R.

51941. To cancel present rates on **gravel, slate or stone, crushed or ground,** in straight or mixed C. L. (See Note 3), further, except gravel or stone, min. wt. not to be less than 72,000 lb., from Danville, Ill., to Cincinnati, Cleveland, Ohio, Detroit, Mich., Erie, Penn., Franklin, Ohio, Grand Rapids, Mich., Lockport, Niagara Falls, North Tonawanda, N. Y., and South Bend, Ind.

51942. To cancel present rates on **slate, crushed or ground,** in straight or mixed C. L., from Cincinnati, Ohio, to Anderson, Ind., and Franklin, Ohio.

51949. To establish on **gypsum tailings,** C. L., Port Clinton, O., to Defiance, O., 130c net ton.

51962. To establish on **limestone,** unburnt, ground or pulverized, C. L., min. wt. 60,000 lb., from Carey, Ohio, to Valley Falls, R. I., 365c per net ton.

51969. To establish on (a) **sand,** naturally bonded molding, in all kinds of equipment; **sand** (except naturally bonded molding; ground or pulverized sand), in closed equipment; and (b) **sand** (except naturally bonded molding; ground or pulverized sand), In open top equipment, C. L. (See Note 3), but orders will not be accepted for closed and open top cars of less marked capacity than 60,000 lb. and 80,000 lb., respectively (see note), from Cincinnati and Delhi, Ohio, to Whitehall-Montague, Mich., 250c per net ton.

Note—When a shipper orders a car of above mentioned marked capacities or greater, and the carrier is unable to furnish car ordered and furnishes a car of greater capacity than that ordered, the min. wt. for the car furnished will be that which would have obtained had the car ordered been furnished and used.

51970. To establish on **limestone,** ground or pulverized, unburnt, C. L., min. wt. 60,000 lb., from Greencastle, Ind., to Cincinnati, Ohio, 175c per net ton.

52010. To cancel present rates on **stone** (crushed, ground or pulverized), **sand, slag** and/or **clay,** mixed with **asphalt,** not exceeding 10 per cent, C. L., from Louisville, Ky., Jeffersonville and New Albany, Ind., to various C. F. A. destinations, on traffic originating at points south of the south bank of the Ohio River and east of the Mississippi River.

52028. To establish on refuse **lime,** min. wt. 70,000 lb. (applies only on shipments in closed equipment), from Milltown, Ind., to Brixment, N. Y., 17c.

52048. To establish on **core sand,** C. L., from the so-called Vassar Group, viz.: Vassar, Wampson, McHale and Juniata, Mich., to Evansville, Ind., 320c per net ton in open top and closed cars.

52052. To amend C. F. A. L. Tariff 367-F, wherein are published rates on **plaster, plasterboard, gypsum rock,** etc., from Mich., and Ohio points to points in Ill., Minn., Wis.,

*Note—The oil, tar and/or asphaltum not to exceed 10% by weight of the commodity shipped, the shipper to so specify on shipping orders and bills of lading.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

Mich. (Upper Peninsula) and Sault Ste. Marie, Mich., by eliminating therefrom Genoa and Woodville, O., as points of origin, account rates being obsolete.

52059. To establish on **sand** (except naturally bonded moulding; ground or pulverized) in closed equipment, C. L.; **sand** (except naturally bonded moulding; ground or pulverized), in open top equipment, C. L., from Muskegon, Mich., group viz.: Grand Haven, Muskegon and Rosy Mound, Mich., to Ironton, O., 280c per net ton in open top and closed cars.

52073. To cancel present rates on **black dirt, cinders, sand** and **gravel**, published in C. F. A. L. Tariff 197-P, from Chicago, Ill., and points taking same rates to destinations in C. F. A. territory.

52074 (Cancels W. D. A. 51087). To cancel Item 4730 of C. F. A. L. Tariff 130-Y, publishing rates on **limestone, agricultural**, min. wt. 50,000 lb., from stations in Ohio on C. & O. Ry. (Hocking Division); C. & E. R. R. (Erie S.); Erie R. R. (West); M. C. R. R.; N. O. Ry.; N. Y. C. & St. L. R. R.; N. Y. C. R. R. (West-O. C.); P. L. & W. R. R.; and from Carey, Durbin, McVittys, Marble Cliff, Marblehead, Melvin, Piqua and Yellow Springs, O., to stations in Ohio, also from Lewisburg, O., to stations in Ohio on B. & O. R. R. (West); C. C. C. & St. L. Ry.; M. C. R. R.; N. & W. Ry.; N. Y. C. R. R. (West-O. C.); N. Y. & St. L. R. R. (except Ft. Wayne, Div.), and P. R. R. (West) on Ohio intrastate shipments only.

52078. To establish on **crushed stone** or **crushed stone screenings**, in open top equipment, C. L., from Marion, O., to Nankin, O., 90c per net ton.

52079. To establish on **crushed stone** and **crushed stone screenings**, C. L., from Waterville, O., to Toledo, O. (for deliveries other than N. Y. C. & St. L. R. R.), 40c per net ton.

52173. To establish on **limestone, agricultural or pulverized**, unburnt, in bags or in bulk, in box cars, in straight C. L., min. wt. 80,000 lb., from Sibley, Mich. to Hancock, 270c; Ishpeming, 247c; Calumet, 282c; Michigamme, 247c and L'Anse, Mich., 252c per net ton.

52181. To establish on **sand** (except naturally bonded moulding; ground or pulverized sand) in open top equipment, min. wt.; **sand**, naturally bonded moulding, in all kinds of equipment, min. wt., from West Newton, Penn., to McKeesport, Penn., 60c on sand (except naturally bonded moulding, etc.) and 90c per net ton on sand, naturally bonded moulding.

52182. To cancel present rate of 60c per net ton on **crushed stone** and **stone screenings**, C. L., from Piqua, O., to Springfield, O.

52185. To establish on (a) **sand**, naturally bonded moulding, in all kinds of equipment, C. L.; **sand** (except naturally bonded moulding, ground or pulverized sand), in closed equipment, C. L.; (b) **sand**, ground or pulverized, in all kinds of equipment, C. L.; and (c) sand (except naturally bonded moulding, ground or pulverized sand), in open top equipment, C. L. (See Note 3), but orders will not be accepted for closed and open top cars of less marked capacity than 60,000 lb. and 80,000 lb., respectively, from Muskegon, Mich., group, viz.: Grand Haven, Muskegon and Rosymound. (Rates in cents per net ton):

	Proposed Rates		
To	(a)	(b)	(c)
Boston, Mass.	475	518	475
Fairfield, Conn.	455	497	455
Plainville, Mass.	455	497	455
Providence, R. I.	495	540	495
St. Johnsbury, Vt.	500	545	500
Seymour, Conn.	455	497	455
Torrington, Conn.	455	497	455
Westfield, Mass.	460	502	460

Route: Rates to be specifically routed.

52190. To establish on **sand** (except industrial), and **gravel**, in open top cars, C L., from Elkhart, Ind., to Plymouth, Ind., 90c per net ton. Route: Via N. Y. C. R. R., South Bend, Ind., P. R. R.

52191. To establish on **limestone, agricultural**, unburnt, in bulk, in open top cars, and screenings, agricultural limestone, C. L., from Spore, O., to Uhrichsville, Newport, Piedmont, 125c; Holloway and Boggs Mine, O., 135c per net ton.

52203. To establish on **stone, crushed**, in bulk, in open top cars and **crushed stone screenings**, in bulk, in open-top cars, C. L., from West Columbus, O., to Two Mile, W. Va., to Bream, W. Va., 150c; Pinch to Marne, W. Va., 160c; Birch Run to Otter, W. Va., 170c, and Graves to Gassaway, W. Va., 180c per net ton.

52204. To establish on **slag**, ground or pulverized, in bulk or in barrels, bags or boxes, C. L., min. wt. 50,000 lb., from Walford, Penn., to Pittsburgh, Penn., 140c and Cleveland, O., 160c per net ton. Route: Via P. R. R.

52209. To cancel rate of $1.51 per net ton on **stone**, silica, from Flint, Ind., to Joliet, Ill., Classification basis to apply in lieu thereof.

Southern

15461. **Fuller's earth**, C. L., min. 70,000 lb. Establish 770c net ton, Ochlocknee, Ga., to Toledo, O.

15489. **Fuller's earth**, C. L. Establish all-rail 840c net ton, C. L., min. 70,000 lb., and 936c net ton, C. L., min. 50,000 lb., Attapulgus, Ga., Jamieson, Midway, Quincy and Superior, Fla., to Corona (L. I.), N. Y.

15491. **Mica**, wet ground, C. L., min. 40,000 lb. Establish 34c cwt., C. C. & O. Ry. stations in N. C., to Savannah, Ga., for transshipment to Pacific coast. Not applicable to shipside.

15498. **Sand, gravel, crushed stone.** Established 80c net ton, Owensboro, Ky., to Robards, Sebree, Morton and Nortonville, Ky.

15506. **Crushed stone**, C. L. Establish rates from Buchanan, Va., to N. & W. stations; Falwell, Va., through Dennison, Va., to be no higher than those in effect from Emil and Rocky Point, Va. Expires Dec. 31, 1937.

15509. **Mica, crude, scrap or waste**, C. L., min. 60,000 lb. Establish 240c from Rocky Mount, Va., and 260c net ton from Martinsville, Va., to Johnson City, Tenn.

15518. **Gravel**, C. L., Establish 225c net ton. Elco, Gravel Pit and Tamms, Ill., to Bellamy, Ala.

15530. **Lime**, C. L., Min. 50,000 lb. Establish 270c net ton to alternate with present rate of 312½c min. wt. 24,000 lb. Reddick, Fla., to Fernandina, Fla. Truck competitive. Expires December 31, 1937.

15553. **Sand**, C. L. Cancel as obsolete rates shown in S. F. T. B. Tariff 388-A, Goldsboro, N. C., to Center Hill and Columbia, N. C.

15576. **Limestone sludge**, C. L. Establish 200c net ton, Birmingham, Ala., and Group to Savannah, Ga.

15578. **Fullers earth and clay**, C. L., min. 50,000 lb. Establish 563c net ton, Mobile, Ala., to Evansville, Ind.

15584. **Fullers earth or clay**, C. L., min. 70,000 lb., not subject to Rule 24. Establish from Mobile, Ala., to Fort Wayne, Ind., 680c; Indianapolis, Ind., 620c; and Terre Haute, Ind., 600c net ton.

15625. **Granules, roofing**, C. L., min. 80,000 lb. Established to New Orleans, La., from Delta, Penn., Slate Hill, Penn., and Whiteford, Md., 630c; Poultney, Vt., and Middle Granville, N. Y., 640c net ton. **Mica dust**, C. L., min. 80,000 lb. Established 640c net ton from Rutherford, N. J., to New Orleans, La.

15631. **Mica**, wet ground, C. L., min. 40,000 lb. Established 34c cwt. from C. C. & O. Ry. stations in N. C. to Charleston, S. C., for transshipment to Pacific Coast. Not applicable to shipside.

Western

E-11-30—Rule: **Lime** in mixed C. L. with cement, between points in W. T. L. C. territory. Rule: Present—As provided in Items 192, 195, 200 and 205 of W. T. L. Tariff No. 207-G, also Rule 10 of Consolidated Freight Classification. Proposed—To provide an exception to the present rules to the effect that when lime is shipped in mixed C. L. with cement, and there are two C. L. rates on the lime, the rate on the lime in the mixed C. L. will be the higher of the two C. L. rates.

E-41-224 — **Sand**, naturally bonded, moulding, C. L. (See Note 2), but in no case will the min. wt. be less than 40,000 lb., from Elwood and Wilmington, Ill., to Charles City, Cedar Rapids, Cedar Falls, Waterloo, Marshalltown, Ottumwa, Fairfield, Newton and Oskaloosa, Ia. Present—Group "A" (Chicago rates), as provided in Item 5260, page 263, Kipp's Tariff 50-P. Proposed—Group "B" rates where lower than Group "A" rates. Amend Column 7, W. T. L. Tariff D-1-B, page 189, Index 58 (Elwood, Ill.), and Index 62 (Wilmington, Ill.), to read Note 212 instead of Group "A," same as provided from Ottawa, Ill., by the Ottawa lines.

E-41-225. **Sand**, naturally bonded, moulding, C. L. (See Note 3), but orders will not be accepted for closed and open-top cars with marked capacity of less than 60,000 lb., and 80,000 lb. respectively. When a shipper orders a car of marked capacity equal to or greater than the above limitation, and the carrier is unable to furnish a car of the capacity ordered but furnishes a car of greater capacity, the min. wt. for the car furnished will be that provided above for a car of the capacity ordered, from Gladstone, Ill., to representative points:

To	Prop. Rate
Abbotsford, Wis.	$2.40
Appleton, Wis.	2.30
Channing, Mich.	2.90
Chippewa Falls, Wis.	2.30
Eau Claire, Wis.	2.30
Escanaba, Mich.	2.90
LaCrosse, Wis.	2.20
Marquette, Mich.	3.20

E-151-13. **Feldspar**, C. L., min. wt. 80,000 lb., from Gibson, Slater and Wheatland, Wyo. Rates: Present—To New Orleans, La., and Jackson, Miss., 1290c per ton of 2000 lb. Proposed—Establish the following rates, which are to be published in W. T. L. Tariff 122-I, in cents per ton of 2000 lb.: To New Orleans, La., 955; to Jackson, Miss., *825. *Under W. T. L. Application No. D-151-8, rate of 700c per ton was approved from Denver and Canon City, Colo., etc., subject to the concurrence of the S. F. A. In the event that this rate is established we propose to establish a rate of 725c per ton from Gibson, Slater and Wheatland, Wyo., to Jackson, Miss.

New England

42569. **Stone, dust, ground or powdered**, Westfield, Mass., to Peterboro, N. H. Present—17. Proposed—$1.95, min. wt. 60,000 lb. Reason—To establish reasonable commodity rate to permit movement of the traffic.

Southwestern

12094. To establish rates on **limestone, crushed, ground, granulated or pulverized**; description and min. wt. as indicated in Item 250 of S. F. A. Tariffs 388 and 227 Series, from Limedale Spur, Ark., to points in states of Alabama, Georgia, Kentucky, Tennessee and Mississippi based on the scales published in S. F. A. Tariffs 388-Series and 227-Series.

12097. To establish rate of 35c per 100 lb. on **silica, crushed or ground**, C. L., min. wt. 80,000 lb., from Rogers, Ark., to Washington, D. C., via routes through Memphis, Tenn., and Birmingham, Ala.

12119. **Lime**, in mixed C. L. with **plaster**, etc., Colo., Ill., Iowa, Kan., Mo., Okla. and Texas, to Southwestern and Western Trunk

Line territories. Add the following to Item 100A of S. W. L. Tariff 31K and Item 5C of S. W. L. Tariff 166A:

"Lime in packages may be shipped in mixed C. L. with one or more of the articles in Section 1, including plaster board, provided that the amount of lime in the car shall not exceed, in weight, twenty-five (25) per cent of the actual weight of the entire C. L. The lime to be charged for on basis of the plaster rate."

12120. **Lime** in mixed C. L. with plaster, etc., Kan., Okla. and Texas to S. F. A. territory. Add the following to Item 5 of S. W. L. Tariff 219:

"Lime in packages may be shipped in mixed C. L. with one or more of the articles in Section 1, including plasterboard, provided the weight of the lime does not exceed 25 per cent of the actual weight of the entire C. L. The lime in the car to be charged for on basis of the plaster rate."

12125. Establish rate of $3.20 per net ton on **dolomite**, C. L., min. wt. 60,000 lb., except where for carriers' convenience a car of less capacity is furnished (See Note 1), from Dolly Siding, Mo., to Omaha, Neb.

12167. **Sand and chatt sand** (except asbestos or silica sand), Webb City, Carterville, Mo., to Birmingham, Brownson, Rockwood, Russellville, Ala., and Knoxville, Tenn. To amend S. W. L. Tariff 92, providing for rates on sand and chatt sand from Webb City-Carterville, Mo., to Birmingham, Brownson, Rockwood and Russellville, Ala., also Knoxville, Tenn., to alternate the present rates that are shown therein with the Memphis, Tenn., combination.

12223. To establish rates on **feldspar** from Gibson, Slater and Wheatland, Wyo., to southwestern destinations which are generally the rates currently in effect from Salida, Colo. Representative rates are shown below in cents per ton of 2000 lb.: Ft. Smith, Ark, 485; Sand Springs, Okla., 485; Shreveport, La., 795; Three Rivers, Tex., 795.

Texas-Louisiana

2472-TX (File 10062-TX). **Retarder plaster of stucco**, between points in Texas. Proposition from shipper to amend Texas Lines' Tariff 72-A, by adding an additional paragraph to Item 10, or publish new item reading substantially as follows:

"Retarder may be shipped in cars containing calcined plaster, stucco and (or) wall plaster at the rate applicable on the other commodities named. The amount of the retarder shall not exceed one (1) per cent in weight of the actual weight of the other articles included in the car, except that when charges are assessed on the min. C. L., wt. of the retarder may equal one (1) per cent of the min. C. L. wt. The quantity of the retarder shipped may not be used to make up the min. C. L. wt."

Shipper states that similar rule is now carried in Southwestern Lines' Tariff 166-A, I. C. C. 2648, and that it is necessary for the gypsum producers to ship a small quantity of retarder with a C. L. movement of plaster for use by the dealer and the plasterer in setting up his plaster on the job.

2477-TX (File 10005-TX). **Sand and gravel, asphalt** coated, from Romayor to Beaumont, Port Arthur and intermediate points. Proposition from shipper to establish rate of 60c per ton to Beaumont, to be subject to character references 2, 9 and 10, of Item 1300, Texas Lines' Tariff 84, and to Chaison, Tex., 60c per ton, subject to character references 2, 9 and 10, and Note 1, of Item 1300, Texas Lines' Tariff 84. To Dowling, Sun, Smiths Bluff, Nederland, Magpetco, Pt. Neches, Rice Farm, Griffing, Pt. Arthur, West Pt. Arthur, 80c per ton. Rates to expire December 31, 1937.

Shipper states that the Railroad Commission of Texas authorized in their Circular No. 11970 special rates on **crushed asphalt rock** and **asphalt coated stone** from Cline, Knippa, Pulliam, Whitesmine and Dittlinger to various points in the Sabine district.

It is here proposed to reduce the rates on asphalt coated sand and gravel from Romayor to the same destinations based on the presently existing special rates on gravel, using as a predicate reductions that have been made on asphalt coated stone.

2487-TX (File 10005-TX). Proposition from shipper to reduce standard rates on **road gravel** or **road stone** to be used only for such construction purposes as do not involve the use of cement and consisting of approximately 50 per cent solid material retained on a ¼-in. screen, the remainder being sand or stone screenings and containing approximately 15 to 30 per cent clay or other similar binder materials by 30c per ton, which will have the effect of establishing a rate of 70c per ton from Klimek to Geana, Olcott and Webster. Rate to expire December 31, 1937.

2517-TX (File 9738-TX). **Feldspar** from Llano, Kingsland and Beverly to Wichita Falls. Proposition from shipper which has been submitted by mail with an expiration date of September 25, 1937, to establish rate of $3.60 per ton of 2000 lb. on feldspar, C. L.

The producers of feldspar at points named above request that consideration be given to establishing commodity rate thereon to Wichita Falls, Texas, which is a consuming point for this commodity. While the proposed rate is relatively higher than those now published from Boulder and other Colorado producing points to Wichita Falls, the shipper states its establishment should enable him to forward shipments to that station.

Lower Cement Rates

Permission has been granted the railroads by the I. C. C. to establish lower rates on cement, in carloads, from New Orleans and other Southern producing points to South Atlantic and Gulf ports. The application for relief from operation of the long and short-haul clause of the commerce act was granted on August 23. New rates will be approximately 70 percent of the present charges, plus one percent, which makes them equivalent to the formerly applicable emergency charges. Relief was granted on the plea that the reduced rates were necessary in order to obtain traffic from domestic cement producing points to the ports, where the domestic product was in active competition with cement imported from Denmark and Germany. Another factor in the hearings held by the Commission involved the trade agreement treaty between this country and Belgium which cut the duty on cement imported from that country from 6c to 4½c per 100 lb. or from 22.7c to 17.1c per barrel.

Sand and Gravel Rates

Intrastate rates on sand and gravel were discussed at an important hearing of the Louisiana Railroad Commission on September 7, with all the railroads in the state as respondents to the citation. The sand and gravel rates now in effect between points within the state are uniformly 25 percent below the interstate rate fixed by the I. C. C. In a case filed some months ago by the L. & N. railroad, the carriers asked the I. C. C. to take jurisdiction over intrastate rate schedules on sand and gravel and raise the latter rates to the level of the interstate rates. To checkmate the increase in local rates, the Mississippi cited all railroads operating in the state to appear and show cause why the existing intrastate rates should not remain in effect.

Mining Congress Exhibits

THE BRODERICK AND BASCOM ROPE CO., St. Louis, Mo., will show a large sample board displaying various types and constructions of "Yellow Strand" and "Flex-Set" preformed construction wire rope at the Annual Metal Mining Convention and Exposition of the American Mining Congress, Salt Lake City, Utah, September 7-10.

SAUERMAN BROTHERS, INC., of Chicago, Ill., will feature a display of Durolite wire rope blocks of various sizes and types. In addition to the display of blocks the company will exhibit several sizes of scraper buckets, and a model of a slackline cableway bucket and carrier assembly.

THE DORR CO., INC., New York and Denver, will have on display scale working models of a new multizone classifier, agitator, and torq thickener. Other working models also to be displayed will include a balanced tray thickener, and turret bowl classifier.

THE ROBINS CONVEYING BELT CO., of New York City will show its idler equipment. Included in this exhibit will be a set of conveyor idlers including troughing and return training idlers, Timken roller bearing standard troughing idlers, ball bearing idlers, and standard roller bearing return idlers.

THE LINK-BELT CO., Chicago, Ill., will feature a scene in action unit of the Roto Louvre dryer. In addition to the dryer, the company will also display a complete arrangement of various types of belt conveyor idlers.

THE GALIGHER CO., Salt Lake City, Utah, will show their Agitair flotation machine. This machine, according to a company announcement, does not discharge the cell contents during temporary shut-downs, nor is it necessary to drain the machine contents; therefore, there are no metal losses.

UNITED STATES STEEL CORP., will display a full-sized model showing a Lorain Rolled Steel Mill Liner, made by the Carnegie-Illinois Steel Corporation. This mill liner will be placed on a background of a large photomural, showing an installation of the liner as it would appear in a ball mill. At the right of the exhibit will be a panel showing uses of Cor-Ten steel in crane booms, shovels, mine cars and other apparatus used in strip and shaft mining.

Dissolved

WOLCOTTVILLE CEMENT PRODUCTS CO., Wolcottville, Ind., has been dissolved.

Concrete Pipe Plants

KEASBEY & MATTISON CO., Ambler, Penn., pioneer manufacturers of cement-asbestos shingles, siding, etc., is entering the manufacture of cement-asbestos pipe on a large scale. A $500,000 plant is under construction at St. Louis, Mo., and a $750,000 plant at Ambler. Pipe of this kind is manufactured under high pressures with special machinery and is taking the place of cast-iron and steel pipe for water mains and similar purposes. It is corrosion proof and will stand hydraulic pressures up to 200 lb. per sq. in.

New Manufacturer

GIBSONBURG ELEVATOR CO., Gibsonburg, Ohio, has installed a concrete block machine.

Cement-Asbestos Products

JOHNS-MANVILLE CO., New York City, has let contracts for a $1,000,000 plant at Long Beach, Calif., for the manufacture of cement-asbestos shingles, siding and pipe. Rock wool will also be made.

Ready-Mix Plant

SAN-GRA-STONE CO., Logansport, Ind., will erect a ready-mixed concrete plant on Water Street. John DeGrief is general manager.

Ready-Mix in London

EXPRESS SUPPLY CONCRETE CO., London, England, has been organized with a capital of approximately $600,000 to introduce ready-mixed concrete in the British capital. There will be six plants located in various parts of the city area. Jaeger truck mixers will be used. This is the second ready-mixed concrete plant to be established in the British Isles, the first being at Southampton, Hampshire.

New President

AMERICAN SILICA SAND CO., Ottawa, Ill., directors have elected Charles J. Niesen, former vice-president and general manager, president to succeed the late William S. Walker. He was also elected president of the Buffalo Rock Coal Co., another of Mr. Walker's companies.

Burial Vault Manufacturers

OHIO CONCRETE BURIAL VAULT ASSOCIATION, under the leadership of Calvin Bell as president, will convene in Columbus, Ohio on October 13 and 14. Among the interesting speakers secured for this meeting will be Russell Knight, executive secretary of The Ohio Funeral Directors Association. His address will deal with the importance of Association work and the necessity of cooperative action now. Mr. Knight is also editor of the official Ohio publication and is doing a remarkable piece of work.

Ready-Mixed Concrete

MCCRADY-RODGERS CO., Pittsburgh, Penn., large sand and gravel producer, has increased its ready-mixed concrete facilities as a result of a general increase in construction activities. The new plant is a high capacity Blaw-Knox batching and "Trukmixer" loading plant at the company's Verona yards.

The main batching plant for aggregates and cement is of Blaw-Knox design, and is claimed to be the largest and most modern plant of its type in the Pittsburgh territory. The aggregate bin has a capacity of 300 tons and is divided into four compartments-in-line. The batching plant is equipped with a 4-cu. yd., four material weighing batcher with a 4-beam scale.

Cement is weighed on a 4,000-lb. cement weighing hopper, which is located on the platform of the aggregate bin alongside of the aggregate weighing batcher. Beneath the cement and aggregate weighing batchers are suspended the confining chutes for loading batches into all sizes and types of truck mixers, as well as into batch trucks. Aggregates will be delivered to the plant by barge.

On the platform of the aggregate bin will be located an automatic water volume measuring tank to provide accurate measurements of the water used in truck mixer operations.

The plant, with one-man operation, will be able to load out accurately measured batches of all the ingredients required for concrete.

Future plans call for the installation of a complete bulk cement plant for unloading the cement from the hopper bottom cars and include an automatic screw conveyor which will carry the cement from the storage bin to the weighing batcher.

High capacity batching and loading facilities of ready-mixed plant

Hobbies, Foibles and

Personalities of Rock Products' Men

M. W. Ferguson, Roanoke, Va.

To M. W. Ferguson, president of the Stone-Tile & Supply Co., Inc., Roanoke, Va., business is not merely an orderly plant, modern machinery and an efficient production and sales system, much as these may be desired. It is far more than that—it is the teamwork of every last man in his organization which has been responsible for the success of this well-known producer of cinder block, concrete joists, precast slabs and lintels and other concrete specialties.

Business is like a ball game to Mr. Ferguson. He takes real zest in "playing the game," making every effort to win over new business for concrete products. The story of his successful venture in the production and sale of cinder concrete products was recently told in Rock Products August, 1937, so that it is not necessary to go into these details, but something of this success may be better understood if one learns about a hobby pursued by Mr. Ferguson during the past two years.

Next to his family and business, the Softball team, sponsored by the Stone-Tile & Supply Co., is closest to his heart. For the past two seasons, the "Cinder Block" team, as it has been aptly named, has been the most outstanding organization of its kind in the State of Virginia, having won the State Tournament over stiff competition in both 1936 and 1937. As a further honor, the team has represented the Old Dominion State for the past two seasons in the National Tournament staged in Chicago under the auspices of the *Chicago American*, one of Chicago's leading newspapers. This year the team lost its national contest by a hard fought 1 to 0 decision against the team representing the State of Utah.

A two-fold purpose lies back of the sponsorship of the Softball team. The first objective was to put the name, "Cinder Block" before the public and keep it there. This objective has been very successfully reached through the thousands of spectators who have attended the games played by the "Cinder Blocks" and through favorable newspaper publicity about the game. Cinder Block has become a familiar name throughout Virginia due to the success of the softball team.

M. W. Ferguson, president, to the left, and C. Grady Cates, sales manager of Stone-Tile & Supply Co.

Promotion of amateur athletics in Roanoke, Va., was another objective. In providing uniforms, balls, bats, etc., as well as expense money for trips, President Ferguson and his official family believed that it was a splendid opportunity for a group of young men to take part in wholesome recreation.

Perhaps the greatest good derived from sponsorship of the team is the friendly employer-employe relations enjoyed by the Stone-Tile & Supply Co. With several employes of the company on the team, the entire personnel of the firm has followed its successful tours each season with close interest.

For the purpose of seeing part of the State Tournament, Mr. Ferguson very generously provided transportation to Richmond for the plant employes, a distance of 180 miles from Roanoke. Such gestures of friendliness have helped to create a better attitude on the part of the employes. Mr. Ferguson also has been very liberal in his dealings with the team; such as, providing excellent equipment, entertainment, etc. The trip to Chicago was financed by receipts from the Virginia State Tournament, a large contribution from the Stone-Tile & Supply Co., numerous contributors throughout the city of Roanoke, and from collections taken up at several games played after the tournament.

"Men—not machines—make a business successful," is the philosophy which has helped M. W. Ferguson and his associates to build a profitable business, and the softball team is one of many ways which he has employed to carry out in practice this principle.

"Cinder Block," softball team of Stone-Tile & Supply Co., Virginia State Champions for 1936 and 1937

Concrete Products
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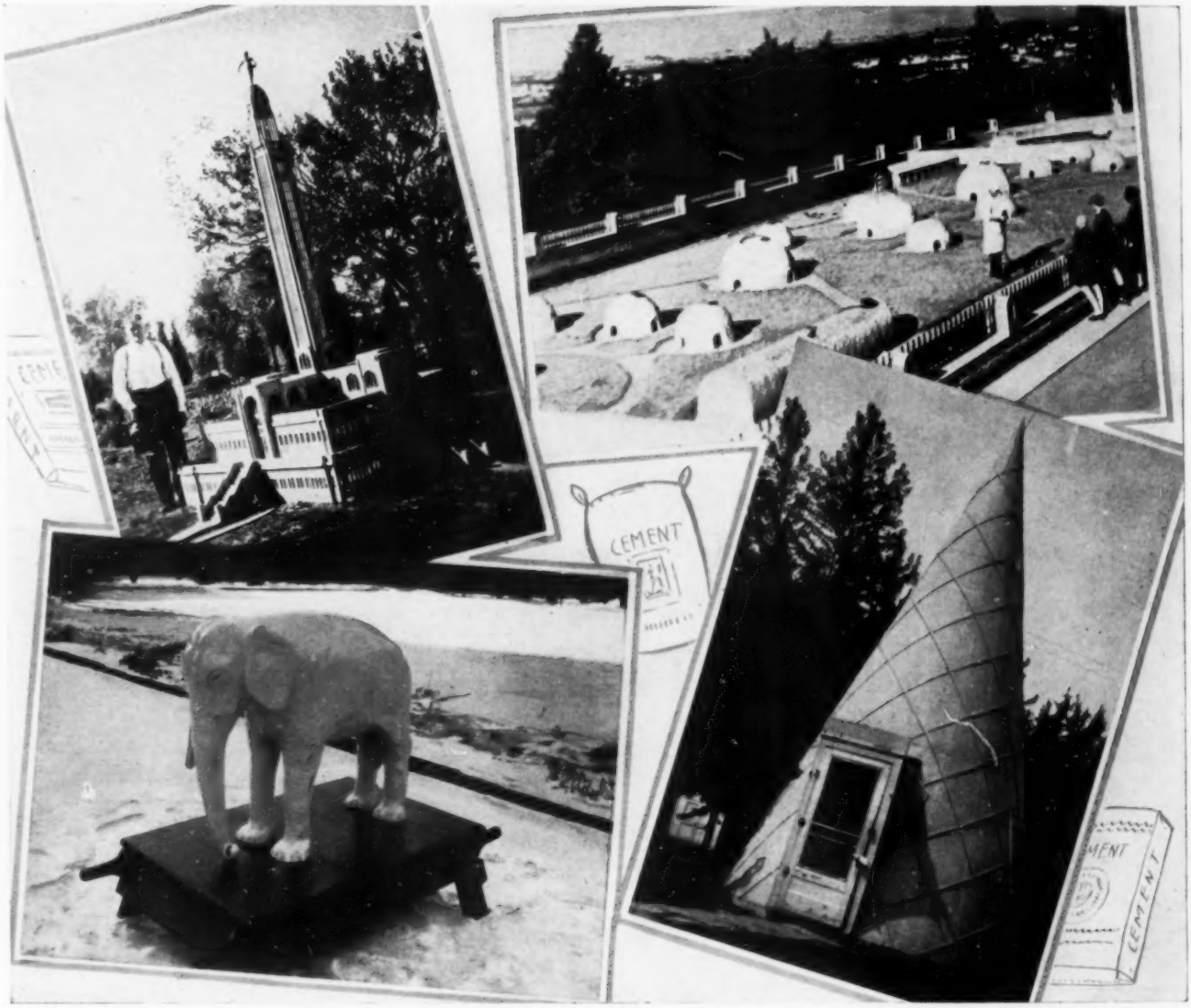
TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Beauty and Utility In Concrete



Above, to the left—Model of the Nebraska Capitol, 12 ft. high, made by F. E. Faustman, Aurora, Nebr.; to the right, dome-shaped concrete snake houses at Sao Paula, Brazil, in which the reptiles live that are used in producing snake bite serum. Below, to the left—Model elephant of concrete is set up by large steel company for three weeks in department having an accident as a "white elephant" reminder; to the right, cone-shaped building of concrete serves to advertise an ice cream stand

CONCRETE MASONRY IS LOW-COST KEY TO *Architectural Distinction*

"Brook House" tea room at Brook Haven, L. I., N. Y., shows the beauty possibilities of concrete masonry when well handled architecturally. Designed by Aymar Embury II, New York City; built by Leslie R. Marchant, Yaphank, L. I. Colored concrete block supplied by Hud-Cin Bldg. Products Co., Westfield, N. J. 4-in. veneer units (hollow) placed over 8-in. block. Color range is grey, buff and brown with white portland cement mortar joints.

CONCRETE MASONRY has all the practical virtues. Everyone knows that it is economical, enduring and strong. Its high fire rating is well established.

But another selling advantage is growing in importance every day—*architectural beauty!* Can you take your prospects to see architecturally outstanding examples of concrete masonry? Can you show them the surprising variety of ashlar patterns and color schemes available today?

One or two fine jobs built with the aid of a progressive architect who has young ideas, will do wonders for your business. Let us send you the booklet, *"Concrete Ashlar Walls,"* showing popular ashlar patterns.

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A National Organization to Improve and Extend the Uses of Concrete.

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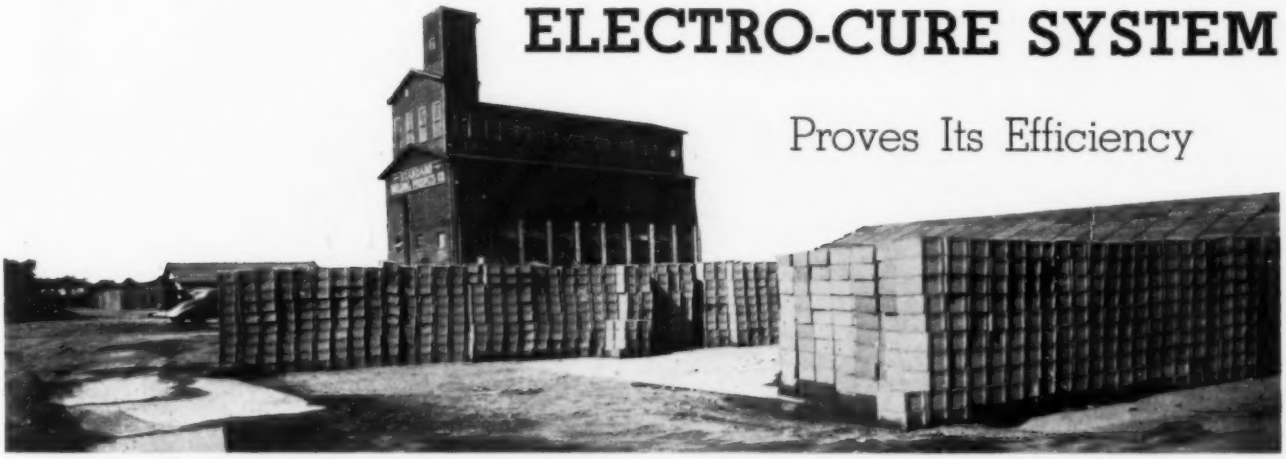
ELECTRO-CURE SYSTEM

Proves Its Efficiency

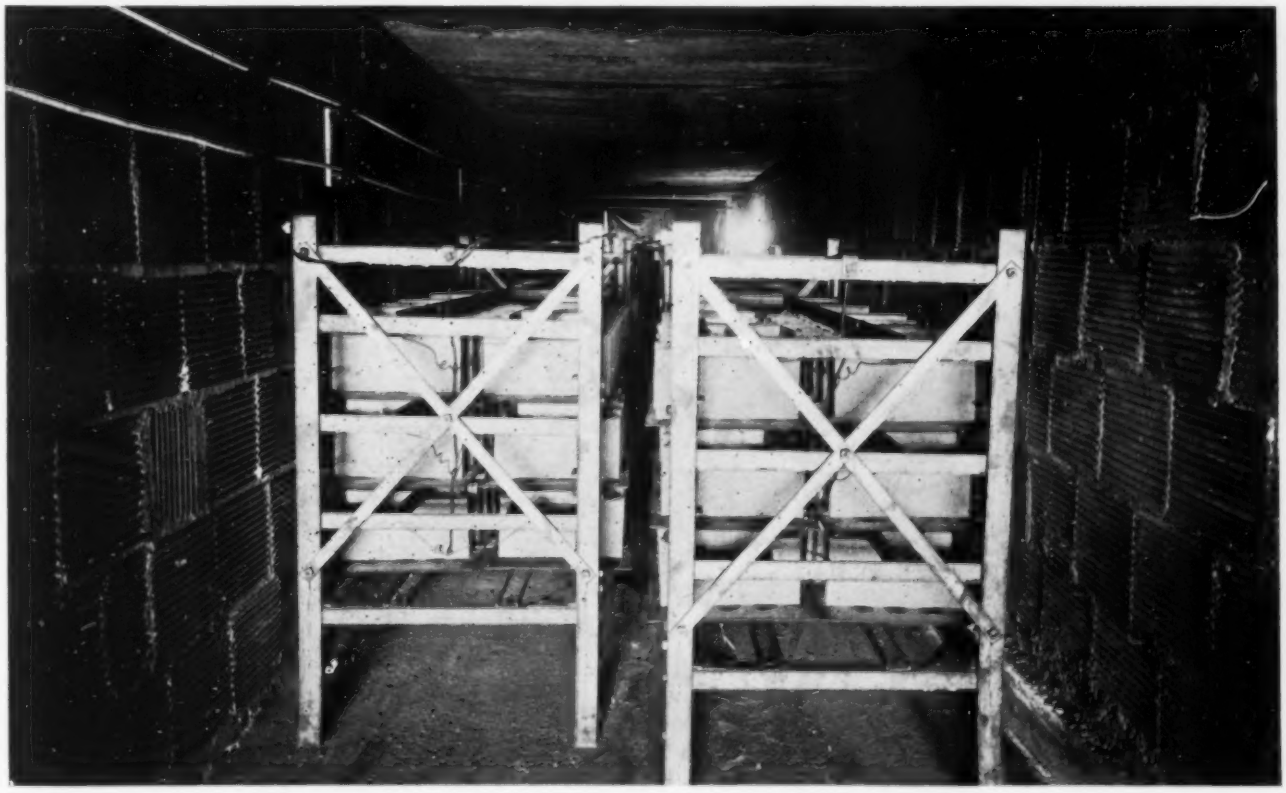


View of the Standard Building Products Co., plant and storage yard for concrete block

CURING CONCRETE BLOCK by the "electro-cure" method at the plant of the Standard Building Products Co., Detroit, Mich., is now in daily operation and has revealed some interesting possibilities. This new process was installed in the Standard Building Products plant by the Technical Development Corp., Detroit, which has been active in the development of this method.

The installation, including the electric unit and special curing racks, has been made in a 62-ft. kiln where the 8- x 8- x 16-in. blocks, 30 of which are placed on each of 14 racks, are cured.

With the "electro-cure" system, blocks are cured in three tiers on a rack and connections are made as described in ROCK PRODUCTS, August, 1937, p. 100, the loaded racks being run into the kiln and the electrical connection to the outlet plug being made at a convenient location.



Special racks holding concrete blocks which are being cured in the kiln by the electro-cure method

Compression Tests

Compression tests of units picked at random in the kiln have shown remarkable uniformity in strength.

On July 15, 1937, with air temperatures of 80 deg. F., a comparison of compressive strengths taken on concrete blocks from this kiln gave the following results:

	Time of Breaking	3 Blks. Average Compression Strength P. S. I.	Increase P. S. I.
5 hr. Electro Cured Blks.	9 hr.	512 lb.	
Air Cured Blks.	12 hr.	368 lb.	144 lb.
5 hr. Electro Cured Blks.	24 hr.	745 lb.	
Air Cured Blks.	24 hr.	599 lb.	146 lb.

Comparative 28 day compressive strengths on electrical and air cured blocks taken August 13, 1937, were as follows:

	Time of Breaking	3 Blks. Average Compression Strength P. S. I.	Increase P. S. I.
5 hr. Electro Cured Blks.	28 days	1223 lb.	
Air Cured Blks.	28 days	1023 lb.	200 lb.

The exact dimensions of the units tested were 8- x 7¾- x 15¾-in. or 122 sq. in. of surface area. All blocks were made at the same time and of the same mix, with the air temperature varying between 70 deg. F. and 90 deg. F., in the 28-day period.

Electro-cure Advantages

Experience shows that the concrete block that are electrically cured for six hours may be readily handled at the end of that period. Cost of curing is approximately $3 per thousand 8x8x16 in. block.

According to Benjamin Wilk, manager of the Standard Building Products Co., the electrically cured units are superior to the ordinarily cured units because:

1. The blocks are cured throughout the mass of the concrete rather than from the outside in. A cross section through an electrically cured unit shows an evenly cured texture rather than a face shell cured texture. Because of this uniform curing, the blocks are stronger and more resistant to rough handling.

2. The uniformity of results in electrically cured units makes it possible to control plant operation within closer limits. This means economy.

3. The block attains a very high percentage of its maximum strength in 24 hours.

4. Curing costs are low because the electro-curing is practically automatic, eliminating labor of tending fires and piping.

5. The moisture driven off by the electro curing process creates a saturated atmosphere which contributes to the uniform curing of the units.

After studying electro curing in this one kiln for the past four months the Standard Building Products Company is now equipping two additional kilns for electro curing.

A description of the "electro-cure" process and the history of its development appeared in ROCK PRODUCTS, April, 1937.

Concrete Pavement Yardage

Awards of concrete pavement for August, 1937, have been announced by the Portland Cement Association as follows:

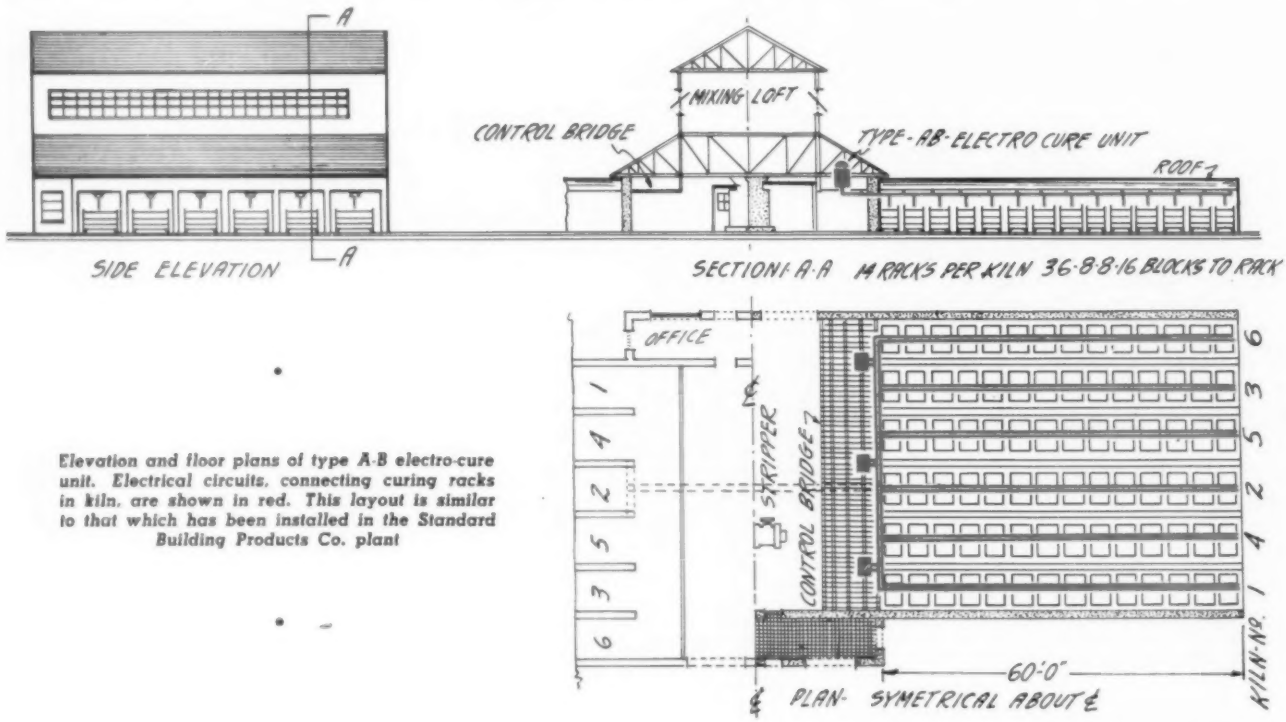
Type of Construction	Sq. yd. awarded during Aug., 1937	Total sq. yd. for year to date Aug. 28, 1937
Roads	4,216,087	28,144,651
Streets	1,466,918	9,108,108
Alleys	100,361	379,366
Total	5,783,366	37,632,125

Pipe Plant

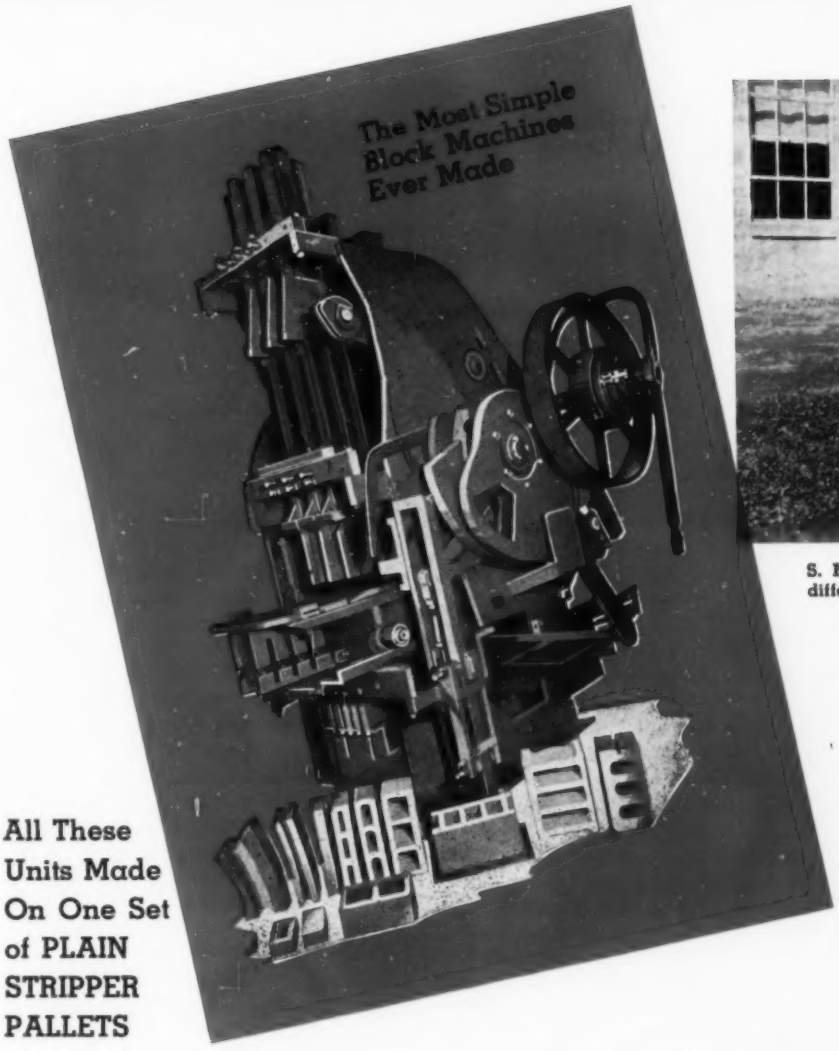
DIXIE CULVERT & PIPE CO., Memphis, Tenn., proposes to build a $55,000 concrete pipe and culvert plant in Fairfield, near Baton Rouge, La.

Expanding

AUSTIN CONCRETE WORKS, Austin, Tex., has moved into its new plant at 2726 East Fifth Street, and installed new equipment, including machinery to make reinforced-concrete pipe up to 42 in. in diameter. Other products are meter boxes, drain tile, well curbing, "Waterseal" roofing tile and building block. H. E. Wattinger is general manager.



Elevation and floor plans of type A-B electro-cure unit. Electrical circuits, connecting curing racks in kiln, are shown in red. This layout is similar to that which has been installed in the Standard Building Products Co. plant



All These Units Made On One Set of PLAIN STRIPPER PALLETS

S. B. Lawrence of Lancaster, Pa., makes 12 different size units on one set of Plain Pallets.

YOU PROFIT TWO WAYS

When you install a Besser Plain Pallet Stripper in your concrete Products Plant you profit by the saving in pallet cost—one set of plain pallets is all that is ever required to make any number of sizes that you will ever want to make.

You also profit by the bigger sales which will result from producing UNITS WITH FULLY PRESSED TOP—units superior in quality and appearance which are made only on Besser Plain Pallet Strippers.

BESSER PLAIN PALLET STRIPPERS

FULLY AUTOMATIC—3 Models—Capacities: 2000 to 4000 units per day.

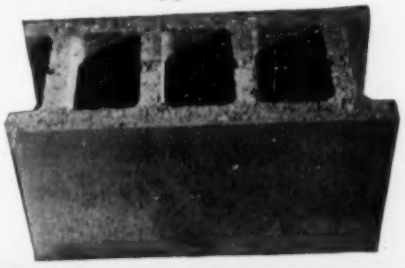
SEMI-AUTOMATIC—4 Models—Capacities: 1000 to 2000 units per day.

POWER OPERATED with Hand Controls—4 Models—Capacities: 500 to 1000 units per day.

MULTI-MOLD—Hand Operated—Capacities: up to 300 units per day. For manhole blocks, brick slabs and small cored units.

AUTOMATIC BRICK MACHINES—Capacities from 10,000 to 50,000 units per day. For brick, slabs, coal cubes and other small units.

Units with FULLY PRESSED TOP have created new and bigger markets for block plants wherever they are being made. Builders and architects say they have always wanted units like these for better class construction. You can make them. Ask us for details.

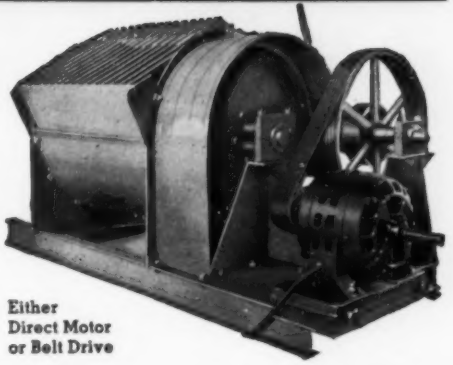


Write for Illustrated Catalog of BESSER PLAIN PALLET STRIPPERS State Production Capacity Wanted

BESSER BATCH MIXERS

Made in All the Standard Capacities—5, 12, 18, 25, 30, 40 and 50 Cubic Feet.

They Mix More Thoroughly and Wear Longer



Either Direct Motor or Belt Drive

Ask for Illustrated Catalog

BESSER MANUFACTURING CO.

COMPLETE EQUIPMENT FOR CONCRETE PRODUCTS PLANTS

Complete Sales and Service on BESSER, ANCHOR, CONSOLIDATED, IDEAL, HOBBS, UNIVERSAL, PORTLAND

210 37TH STREET ALPENA, MICHIGAN

EVERY CONCRETE PRODUCTS PLANT NEEDS A BESSER PLAIN PALLET STRIPPER

California Building Numerous

Concrete Homes

Opening New Opportunities for Manufacturers

ONE OF THE SIGNIFICANT RESULTS of the recent increase of home building in southern California has been the marked development in methods and design of concrete houses. These are not confined to small residences, but ingenious architectural creations are in evidence in all price fields. Solid wall, hollow wall, rib type, concrete units and gunite houses are all in increasing favor. A number of building contractors are specializing in concrete construction, and in many instances have developed their own particular forming methods. Promotional work of the Portland Cement Association has created a surprising amount of interest among the architects. Other factors which favor the public popularity of concrete homes are the infestations of frame structures by termites and the prevailing architectural styles which lend themselves perfectly to concrete construction. Typical examples of houses built by the various systems are shown in the illustrations, and the important details of their construction and finish are described.

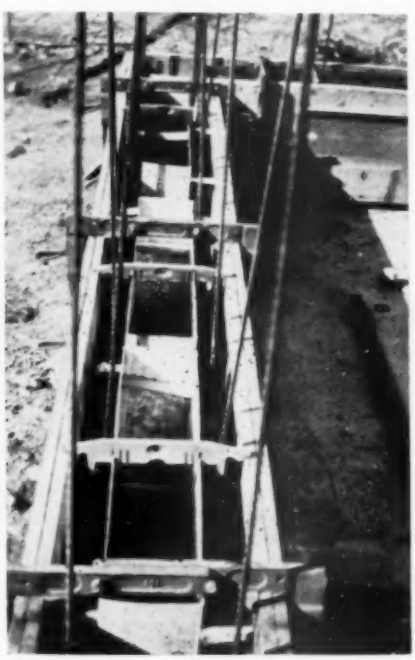
Adams Residence

The Palos Verdes Rancho, an 8000 acre hilly peninsula estate, acquired by the late Frank Vanderlip, stretches from San Pedro to Redondo Beach. Only recently a part of the northerly portion of this Rancho has been subdivided into three to five acre parcels which are quite properly known as Rolling Hills Estates. For this setting, Architect James R. Friend of Long Beach, designed a new concrete home for Mr. Frank Adams. The contractors, the Harmon Pacific Co., executed the design, using the McKee System for constructing hollow walls. This system utilizes wooden outside forms approximately 2 ft. wide and 12 ft. long. The cores or air spaces are formed by collapsible sheet metal forms. These outside forms and cores are held in position by special U clamps and spreaders, and require no ties through the wall. One of the illustrations clearly shows the means used to accomplish this end. Concrete is placed in 18-in. lifts, a pour being made each day. The bottom of the outside and core forms registers with the concrete poured on the preceding day, and excellent alignment is thereby attained. The floors throughout this house are built directly on the ground. Damp proofing from soil moisture is obtained by pouring the floor slab over approximately four inches of crushed rock spread and tamped on the prepared subgrade. The hardwood floors are laid directly on the slab after it has been treated with an asphalt mastic. The inside and outside of this house was finished in hand plaster.

Castera Residence

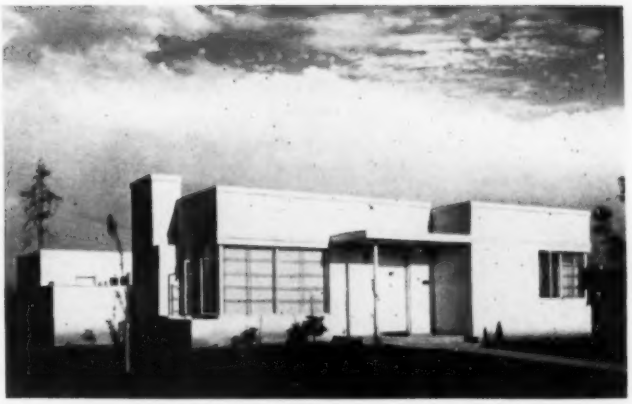
Bel Air is located in the Hollywood Hills. The Castera residence, designed by Architect Paul R. Williams, of Los Angeles, is of the ribbed wall type and

Residence of Dr. Kully built with slumped concrete units laid as a random ashlar veneer



Collapsible sheet metal forms used in McKee system

Castera residence is of the ribbed wall type



Romanes residence built with hollow concrete walls

was constructed by Contractor Geo. Holstein using simplex forms. These consist of flat, reinforced steel panels 24 in. and 48 in. high with rib spacing of 18 in. and 24 in. The interior forms are shaped to conform to the rib and wall profile, and extend from the center of one rib to the next. Ties through the walls occur at the center of the ribs only and are spaced approximately 2 ft. on centers. The inside forms for wall construction are braced with steel ties between adjoining ribs, vertical stiffness at the center of the span between the ribs, and by diagonal struts between the vertical stiffener and rib strut in a horizontal plane. These forms are readily adaptable to solid wall construction in which case flat outside type of forms are used on both sides. It can be seen that the inside forms laid flat would adequately serve for pouring ribbed floor or roof slabs and were so used. Pouring was done in two-foot lifts on successive days. The floor slabs were treated similarly to those in the Adams residence. The interior walls were plastered on metal lath supported on the exterior wall ribs.

Pendell Residence

The Pendell home designed by Architect Elmer Marten, is located in Temple City, a community in the San Gabriel Valley about ten miles east of Los Angeles. The method of forming this job is unique. It was devised by the architect and bears his name. The exterior walls are of the rib type. Permanent core forms made from plaster board on the job are used. Two pieces, the width of the space between adjoining ribs, and two pieces, the depth of the ribs, all of a length equal to the height of the wall are bound together with a tying machine. These core forms are erected on the poured foundation in proper positions and held by temporary centering at the top. After the necessary reinforcing was in place and the interior rib soffits were closed with boards, the ribs and wall sections were shot with gunite. When cured, the boards were removed from the rib soffits, and the inside was plastered on the interior face of the core forms and ribs. The same type of forms were used in pouring the floor slab. Similar plaster board core sections were laid at the designed intervals on a leveled subgrade. After the installation of reinforcing, the floor and integral ribs were poured with concrete. This produced a concrete floor with only the rib soffits in contact with the soil. The plaster board cores together with the air spaces greatly increased the thermal insulation of the floor. A floor constructed by this method presents small hazard from soil dampness, and permits the laying of hardwood floors directly on the slab without specific waterproofing treatment.

While most of the homes described by Mr. Roalfe are of monolithic concrete construction, the unusual activity in building concrete houses on the West Coast is of general interest as these building developments offer excellent possibilities in marketing ready mixed concrete. Costs have been reduced to the point where concrete houses now may be sold on a price parity with other less durable construction.

—The Editor

Romanes Residence

The new home of Jack Romanes is located in Lakewood Village, a residential suburb of Long Beach. It was also designed by James R. Friend, using the MacKee system previously described. It has hollow concrete walls and slab floors built on a crushed rock cushion directly on the ground.

Model Home

Architect Theodore Jacobs designed the model home built by Stoltz Construction Co., in Monterey Village, North Hollywood. This house is entirely modern in design and appointments, has been completely furnished and is open for inspection by the public. The builder is using this unit as a sample, and is offering to build duplicates or similar houses of this type of concrete construction at the same price. This home was built by the Hayes system of hollow wall construction. Full story height steel forms are used with dimensions of 4 ft. by 8 ft. The interior and exterior walls and cell webs are only 2 in. in thickness. The entire thickness of the wall is 10 in. Core forms collapse and are pulled by a special lever jack of their own design, producing clean work. The interior partitions are 2 in. of concrete solid slab poured in place in full height. Floors are constructed of concrete with the usual bed of crushed rock beneath. The finish floor and trim is of wood.

Dr. Kully's Residence

In designing the Hollywood home of Dr. Barney Kully, Architect Heth Wharton utilized slumped concrete units. It will be noted in the illustration that the exterior treatment is a random ashlar veneer; the color effects were obtained by acid staining of the units at the fabrication plant. This type of veneer work both in stained and with natural units are laid up with either struck or shoved joints, depending upon the effect which is desired. They are making definite inroads into the brick veneer field.

The foundations, and floor slabs and the walls, where solid, were poured with aggregates up to a maximum of 1½-in. The ribbed and hollow walls, with the exception of the Model Home were poured with aggregates up to ½-in. In the Model Home, pea gravel or ⅜-in. material was used for coarse aggregate.

An Advertising Campaign That

RINGS THE BELL

By "SPEC" COLLINS

WHILE it is the usual thing for large users of advertising space to employ an advertising agency to prepare and place their copy, it is quite unusual in the concrete products business. Ed Olsen of the Badger Concrete Co., Oshkosh, Wis., has done that unusual thing.

His present advertising campaign, prepared by the Lawrence Walter agency in his home town, is bringing numerous inquiries to the plant of the Badger Concrete Co.

Olsen's campaign is worthy of more than passing comment because it is so unlike any other that the writer has seen in the concrete products business. It has a certain "breezyness" about it. It tells a rather difficult story in a conservative manner and through clever illustrations, a certain harmony and continuity is achieved.

Says Ed Olsen of his advertising venture—"By employing an agency to handle our advertising, we hope to eliminate that old, old bugaboo,—uninspired preparation of advertising material. Our results so far seem to bear out the fact that we've done a good job of eliminating. We've secured harmonious appearance, a factor in advertising just as it is in personal selling. Naturally, in the preparation of this copy, we're going to take advantage of every idea we can secure from the Portland Cement Association, Concrete Masonry Association and other societies, but we are going to adapt them to our product and to our style, and by doing this through an agency we hope to secure continuity and correlated effect mechanically, which might not otherwise be possible.

Merchandising Is Major Problem

"Our major problem, besides manufacturing, is that of merchandising. We have had a lot of national advertising through agencies such as the Portland Cement Association, but as I see it, this really isn't worth anything unless we correlate it into a local campaign that will do a skillful job in the local market as this national advertising does for the national market.

"We are mighty busy all year around —just couldn't have a great deal of time to sit down and prepare advertising copy. Yet we know that advertising should be a part of our complete sales and merchandising plan. Again, we don't know anything about type or our local composing room's limits and abilities. The employment of an agency has certainly helped us and we have recommended a similar procedure to other manufacturers.

"When Mr. Walter approached us he outlined our problem as follows, if we were to do an effective job of coordinating our advertising and personal selling:

"1—We should be making a constant

Samples of distinctive advertising copy used by Badger Concrete Co., to sell concrete products

study and tie-up with material that P. C. A. is furnishing.

2—We should obtain whenever possible, publicity for local buildings of concrete and the widest possible circulation of photographs.

3—We should regularly contact by mail our mason contractors and others engaged in the building trade.

4—Inasmuch as burial vaults comprise a good part of our business, we ought to have regular contacts with all funeral directors in our market. Much of this could be done by letter, but we plan to produce a simple, dignified folder, describing burial vaults, which these directors in turn can pass on to their prospective customers.

5—A complete coordination of our advertising activities with our merchandising.

Cement Waterproofing

REARDON COLOR & CHEMICAL WORKS, Cincinnati, Ohio, announce the perfection of a process for making calcium stearate in bead form. The new material is now being marketed. Steps to perfect patents are under way. Calcium stearate is recommended in the reports of the National Bureau of Standards for waterproofing cement and it is widely used in cement manufacture.

The advantages claimed for the Reardon process of making calcium stearate in bead form are:

(1) An increase upon analysis in the true calcium stearate to 95.1 percent. This is higher than in the powdered form.

(2) Reduction of approximately 25 percent in price.

(3) The beads are about ⅛-in. in diameter, very irregular in shape and are fed into the grinding mill with the cement clinker. There is practically no mixing cost.

(4) Because of their irregular shape, the beads tend to travel along with the clinker and insure a more uniform dispersion than is possible with a dry powder. The beads thus become thoroughly interground with the cement.

(5) The beads are absolutely dustless and increase operating cleanliness and convenience.

Colored Cement

ASSOCIATED PORTLAND CEMENT MANUFACTURERS, LTD., London, Eng., at their Kent plant, are making red and yellow cements, by grinding a mineral color in with the clinker.

PYRASTEEL

FOR HIGH TEMPERATURES

1950° F.

PYRASTEEL for High Temperatures

PYRASTEEL is a chrome-nickel alloy that will withstand temperatures up to 2200° F. without oxidizing or warping. Hence it is unsurpassed for making such parts as spiral conveyors, hot clinker drag chains, cooler charging lip castings, furnace conveyor links, clinker cooler lifters, nose rings and kiln ends.

Our Cement Mill Department will welcome the opportunity of showing you how Pyrasteel will cut your costs per barrel.

CHICAGO STEEL FOUNDRY CO.
37th Street & Kedzie Ave.
CHICAGO, ILL.
Makers of Alloy Steel for over 25 years

STURTEVANT

AIR SEPARATORS

213 STURTEVANTS sold on approval for Cement. Not one rejected.

"HIGH EARLY" and regular cement 1500-3300 S.S. Area.

Engineered Installations for raw or clinker show 25 to 100% capacity increase.

STURTEVANT
MILL COMPANY
HARRISON SQUARE
BOSTON, MASS.

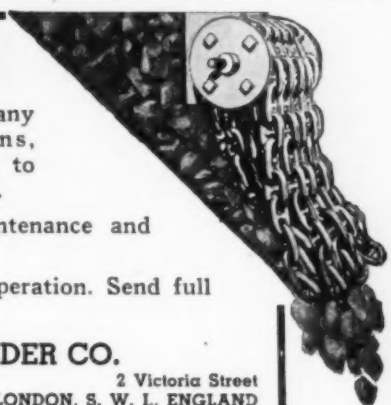
CONCRETE PAINT

TAMTEX
WATER CEMENT PAINT
in Powder Form
Waterproofs and Beautifies Concrete Products
Write for Color Card
TAMMS SILICA COMPANY
228 North LaSalle St. Chicago, Illinois

CEMENT COLORS

CEMENT COLORS
Will not fade—extra fine and strong
TAMMS SILICA COMPANY
228 North La Salle St. Chicago, Illinois

THE ROSS FEEDER



Completely controls the flow of any size material from Storage Bins, Hoppers or Open-Dump Chutes to Crushers, Conveyors, Screens, etc.

High in efficiency. Low in maintenance and power consumption.

Furnished in sizes to suit your operation. Send full particulars for recommendation.

ROSS SCREEN & FEEDER CO.
247 Park Avenue, NEW YORK, U. S. A.
2 Victoria Street, LONDON, S. W. 1., ENGLAND

STAR and ANCHOR COLORS
Geo. S. Mepham Corp., East St. Louis, Ill.
C. K. Williams and Co., Easton, Penn.

CORED STEEL PALLETS

Cored pallets have important advantages that should be considered by block manufacturers before making investments in plant equipment.

Blocks made on cored pallets are better because they cure quicker and more uniformly, this cuts costs, more blocks can be put on racks or cars, kiln capacity is increased. This is economy.

Cored pallets are lighter in weight, less effort is required to handle production. This betters labor conditions.

Investment costs in machinery used in cored pallets is lower. No additional mould boxes are required for various heights of units, and cost of attachments for different widths or lengths is less than attachments on plain pallet machines.

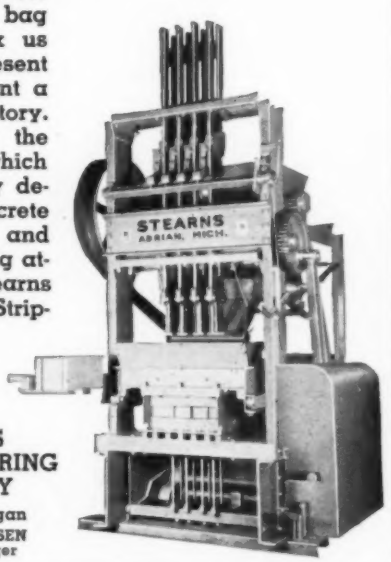
Before buying pallets investigate "COMMERCIAL" steel pallets.

Write for catalog.

The COMMERCIAL SHEARING & STAMPING COMPANY
YOUNGSTOWN, OHIO.

No Other Stripper Makes as Many Blocks Per Man

Easily capable of 2000 units in 9 hours, this Stearns Power Stripper makes plain block of any size, rock face, headers, manhole block, brick and tile. The multiple bar alternate tamping action improves quality, eliminates seams, increases the block yield per bag of cement. Ask us for list of present users—each plant a leader in its territory. We also make the Stearns Mixer which is particularly designed for Concrete Products Plants and Straub oscillating attachments for Stearns and Anchor Strippers.



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STEARNS MANUFACTURING COMPANY
Adrian, Michigan
EUGENE F. OLSEN
General Manager

PRODUCE HIGH EARLY STRENGTH

Normal, all-purpose, masonry, plastering and stuccoing cements under the several BLANK patented processes.

•

Inquiries invited from producers of cement, lime and allied products.

Patents issued and pending in the United States, Canada, and in leading Central and South American and European Countries.

Investigations and experimental tests carried out at plants of interested producers by technical experts familiar with processes at no cost to producer.

Our booklet No. 1 will be sent interested parties on request.

CEMENT PROCESS CORP.

John A. Blank, Chemical Engr., Cement & Lime Plants Division, 710 So. 6th St., Ironton, Ohio
MAIN OFFICE 90 Broad Street New York
Wm. J. Kuntz, Agent, Lime Plants Division, P.O. Box 574, York, Pa.

MEXICAN BRANCH
P.O. Box 515, Mexico City, Mexico

This New Method of Making SAND LIME BLOCKS WILL PAY YOU BIG PROFITS

Jackson & Church have perfected this new press for making sand lime blocks without the use of pallets or racks. This results in considerable saving in initial cost of equipment. The special tamping features make it possible to produce blocks which are so dense that they can be handled directly from the press. The only pallet used is the one that remains permanently on the table of the press. Production can be maintained steadily at the rate of over 250 blocks an hour.

Be first in your city to capitalize on this new process. Write for complete details today.

JACKSON & CHURCH CO.
SAGINAW, MICHIGAN

Wm. C. Dahl and Chester E. Perkins, who head the Northern Indiana Brick Co.

Add New Equipment to

Produce Sand-Lime Blocks

at Northern Indiana Brick Co. Plant

ANOTHER STEP FORWARD in the production of sand-lime building units has been taken by the Northern Indiana Brick Co., Mishawaka, Ind., with the inauguration on September 1, of the manufacture of sand-lime blocks. Less than ten years ago, May 28, 1928, this company erected its present plant six miles east of South Bend, Ind., for the manufacture of sand-lime brick.

Residential, commercial, and industrial building in the South Bend area has brought about an active demand for building blocks for subgrade construction, and to meet this situation, the Northern Indiana Brick Co., decided to expand its plant facilities to manufacture sand-lime block as well as sand-lime brick. Chester A. Perkins is president of the company, and Wm. F. C. Dahl is treasurer and general manager.

New equipment recently installed includes a newly developed power-operated block press made by the Jackson & Church Co., Saginaw, Mich., which also furnished practically all the original sand-lime brick equipment.

Sand for the manufacture of the sand-lime products is obtained from a pit 30 yd. west of the plant by means of a drag scraper excavator. The excavator delivers the sand to a belt conveyor which moves it to the sand storage bin inside the plant. Adjacent to the sand storage, is a bin containing high calcium lime hydrate. Sand and lime from each bin is discharged in measured quantities, by means of depth gates, on to individual belt conveyors which empty into a Jackson & Church rod mill in which the sand and lime is mixed and the sand ground. The rod mill mixes the sand and lime with sufficient water added to dampen the mixture to about the consistency used by founders in preparing moulding sand. The mixture used by the Northern Indiana Brick Co., is one part lime to five parts sand by volume, or approximately 6 lb. of lime to 94 lb. of sand by weight.

Sand lime blocks stacked in yard and some of the men who make them.

From the rod mill the mixture is moved by a belt conveyor to the second story of the plant where it is chuted to the individual hoppers which feed the brick and the block machines.

The new press, operated by a 3-hp. electric motor, has a capacity of 250 units per hour. It is a strip machine, the blocks being made with vertical cores, and they are ejected upward from the mold box. One block is made at a time. The weight of the tampers is 120 lb. each, and they have a drop of 20 in. on an area of 5 sq. in. Block sizes manufactured are: 8x8x16-in., 8x12x16-in., 4x8x16-in., and fractions of blocks, corners, and jambs. A very strong sand-lime block is produced which can be lifted by a special clamp and piled on a hand truck, one block on top of another, in tiers five blocks deep. No racks are necessary, and the only pallet used is the one that remains permanently on the table of the machine.

Hand trucks, on which the output of the block and brick presses are placed, are then wheeled on narrow gauge track into two Jackson & Church 7x 87½ ft. hardening cylinders, or autoclaves, where the products are subjected to steam pressure of 100 lb. p.s.i. for a period of eight hours. When the blocks leave the autoclaves they are completely cured and ready for shipment.

New type block machine in operation

New MACHINERY & EQUIPMENT

Respirators

H. S. Cover, South Bend, Ind., is now making a fuzzy, sock-like material, used as a protective knitted hood, that can be drawn snugly over the filter apertures of a respirator. It keeps filter pads free of excessive dust cake or accumulation and saves clogging, adding many hours to life of respirator filters. In cases where respirators are worn by men working in heavy dusts sometimes encountered in cement mills, this handy knit covering fills a long felt need. When dust cake and moisture from breathing starts to form a mud-pie like substance on the "Nite-cap," all the wearer need do is remove it and shake free. Ordinarily this heavy dust formation would be deeply imbedded in filter pad and filter would be ready for replacement. The elastic edge of the hood makes it easy to slip on or take off whenever desired.

Knitted hood for filter

Hug Lugger

The Hug Co., Highland, Ill., has announced a new Hug Lugger, Model 20. This new truck, according to the manufacturer, embodies all the features of the Model 30 Hug Lugger on a smaller scale, with an 8 cu. yd. body and an unusually high dumping angle hoist. Complete hoist control is secured at any angle at all times. Electric arc welding throughout the entire chassis is another feature The Hug Co. stresses for low maintainance cost, while the operating costs are held to the minimum by the Caterpillar Diesel engine.

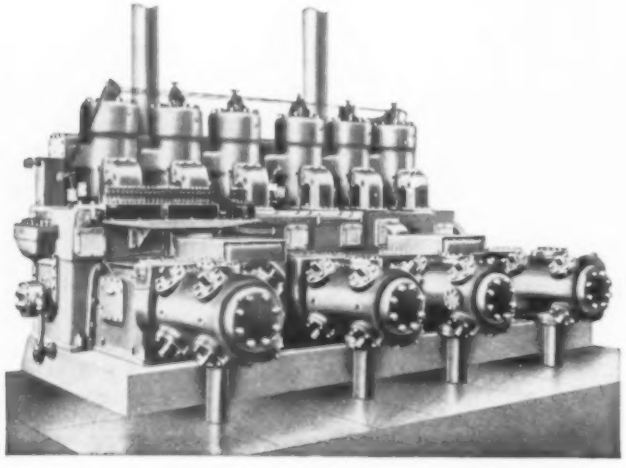
Lugger with 8 cu. yd. body

"Super-2-Angle" Compressor

Clark Brothers Co., Olean, N. Y., is now in production on the new 6-cylinder, 600 h.p. size of their "Super-2-Angle" compressor, introduced a little more than a year ago. This compressor is offered in 2, 3, 4, and 6 cylinder sizes, ranging from 200 h.p. to 600 h.p.

It is claimed that this compact, right angle compressor, while occupying much less floor space per horse power than horizontal types, includes all the desirable features of the horizontal compressor. The Super-2-Angle fuel injection system used for many years on Clark horizontal compressors is a feature of the new angle machine, as well as the special scavenging method which provides 25 per cent excess air for the power cylinders.

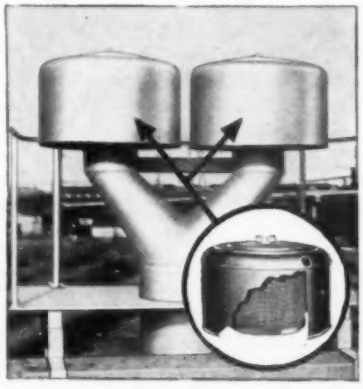
The manufacturer announces that the new 6-cylinder unit is to be used on six large jobs.



Compressor with new fuel injection system

"Air-Maze" Filter

Air-Maze Corporation, Cleveland, Ohio, has brought out a new "Multimaze" air filter. It is a compact, cleanable, metal fabricated air filter of patented construction which is obtainable in various sizes for internal combustion engines, air compressors, blowers, and air conditioning systems. Air cleaning efficiency is claimed by the manufacturer to be better than 99 percent; restriction less than $\frac{1}{8}$-in. water. A Multimaze installation requires a negligible amount of space even when the application demands thousands of c.f.m. per minute. For certain types of air conditioning installations, the Multimaze units are more suitable than panel filters. The circular units take less space, can be better protected against the weather, and are easier to maintain. The filter element media may be especially constructed so that air cleaning problems where lint or other disturbing factors may be easily circumvented.



Air filter for engines

Truck Crane

THE NORTHWESTERN ENGINEERING CO., Chicago, Ill., claims that for the first time truck crane mobility may be obtained with high quality and ruggedness heretofore characteristic of crawler crane design. These features are incorporated in the design of its new truck-crane, recently announced. Northwest truck cranes are built in sizes of ⅜-, ½- and ¾-cu. yd. capacity, and they may be equipped as crane, dragline or shovel. They are unique in that the rotating bed plate is a casting with side frames cast integral, assuring the permanent

Easily moved truck crane

alignment of shafting. The power take-off is said to be the finest type of speed reducer, a helical gear drive mounted on ball and roller bearings and running in oil in an oil tight housing. Ball and roller bearings are used on all high speed shafting. The cushion clutch, control, ventilated uniform pressure swing clutches, adjustable hook rollers, and worm boom hoist are all standard equipment.

Heated Asphalt Bucket

EASTON CAR & CONSTRUCTION CO., Easton, Penn., has developed and is now marketing an electrically heated bitumen weigh bucket. Continuous adjustment for tare weight is not required

Electrically heated asphalt bucket

with the electrically heated bucket. It is of the non-dumping type, the bitumen contents being released by spraying, which insures a more even coating of the stone. There is a clean discharge of each filled bucket as the side walls

Tractor scraper with only one lever and one cable

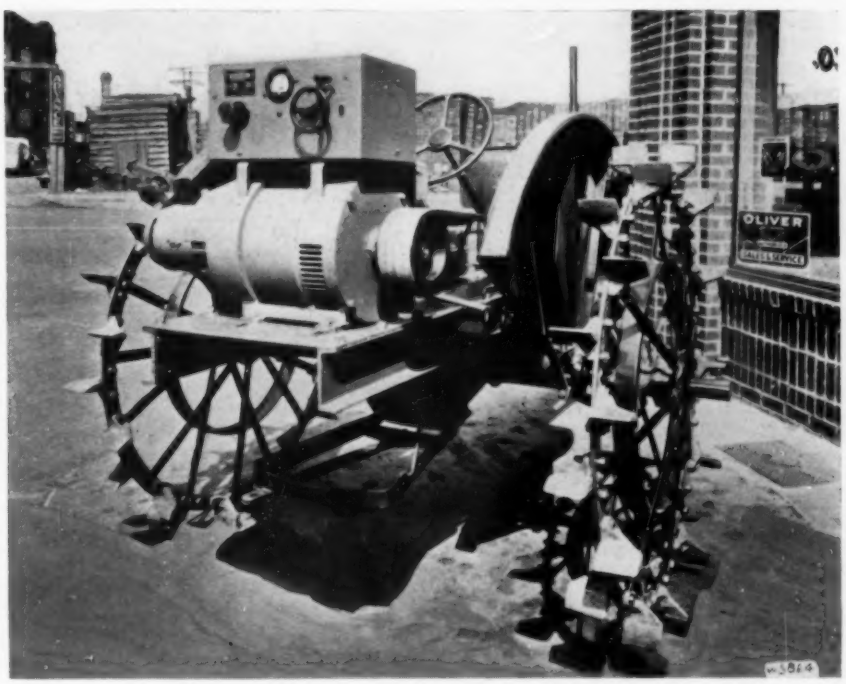
are electrically heated to keep the bitumen contents at sufficiently high enough temperature to assure fluidity. This reheating action as the bitumen flows from the bucket promotes easier mixing with the stone. Instead of bulky and somewhat troublesome steam connections to the bucket, the electric heater connection is comparatively simple. It also eliminates any chances of water or steam mixing with the bitumen.

Tractor Becomes a Welder

THE LINCOLN ELECTRIC CO., Cleveland, Ohio, describes a new use for a farm type tractor. This new use was demonstrated recently when the Southern California Tractor Co. of Los Angeles fitted an arc welding generator to a regulation size tractor. The generator is a Lincoln Electric standard model, 200 amp. unit. The Southern California Tractor Co. is prepared to supply this type of unit in several different models and sizes.

Five-Yard Tractor Scraper

THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Ill., announces that a new model scraper has been designed which may be loaded with ease and speed. This model replaces a popular scraper also known for these qualities. Like its predecessor, the new scraper uses but one cable and one lever to control all loading, carrying and dumping.



Welder made portable by mounting on tractor

and is designed to work with any tractor within the horsepower range of 35 to 60. Adjustments have been provided for varying the clearance under machine, and the front door is so constructed that the pan will always get a full load. Several of these machines are already in operation, and users report capacities up to 60 yards of pay dirt per hour.

Mining Drifter

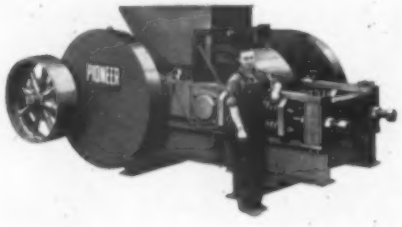
INGERSOLL-RAND CO., 11 Broadway, New York, N. Y., has recently introduced a new drifter drill called the DA-30. It is in the 125-lb. class, and is

Drifter for small tunnels and stopes

ideal for many mining operations such as, small drifts, tunnels and stopes. A new double-opening valve has greatly increased the drilling speed without increasing the air consumption. This new drill is reported to be equally as popular as its bigger brother, the DA-35 which was introduced in 1936.

Roll Crusher

PIONEER GRAVEL EQUIPMENT CO., Minneapolis, Minn., announces a new and larger roll crusher for use in the larger plants where greater production and a larger stage of reduction are required. The rolls are each 54 in. in diameter and 24 in. in width. The crusher incorporates manganese steel shells, posi-



Larger type roll crusher

tive adjustment, Star gear drive, Timken bearings, spring release and an enclosed gear drive.

Portable Pyrometer

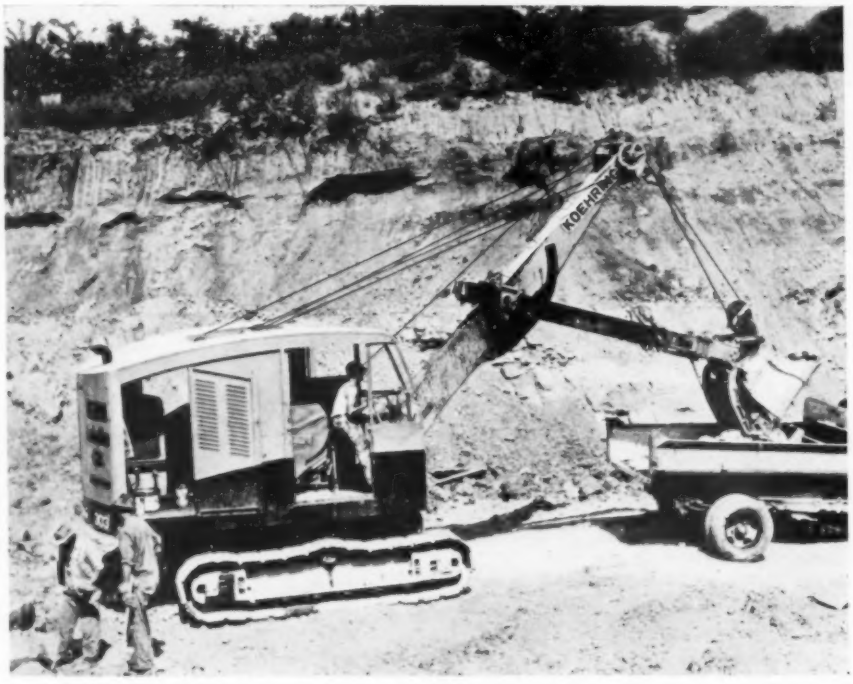
THE BRISTOL CO., Waterbury, Conn., is now offering a new millivoltmeter-type portable indicating pyrometer, measuring temperatures up to 3000 deg. F., using a thermocouple and extension leads. Use of a cobalt magnet allows exceptional design features, including increased sensitivity, and a widened scale for more accurate readings. Unusual sensitivity is accomplished without the need for critical leveling adjustments and with no sacrifice of ruggedness. The high-resistance millivolt-

Pyrometer records temperatures up to 3000 deg. F.

meter movement is double-pivoted and completely shielded to prevent the effects of stray fields. The molded Bakelite case is of moisture- and dust-proof construction, and of modern design, and the instrument is available in single and in double ranges.

Small Excavator

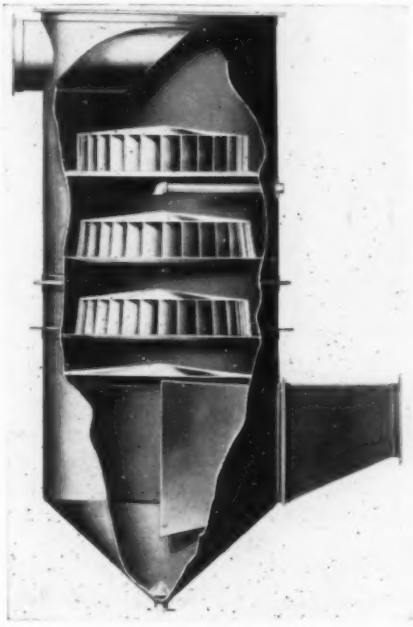
KOEHRING CO., Milwaukee, Wis., has announced a new ¾-yd. shovel, Model 303. It is a high speed, light weight machine, designed according to the latest developments and heavy duty construction throughout. The use of high strength special steels, combined with welded construction and simplified design has produced a machine of exceptional strength, with a substantial decrease in weight. It has high speed, great operating ease and exceptional traction and steering flexibility. The 303 is fully convertible, with a 1-yd. rating as a crane or dragline. Attachment changes are easily and quickly made on the job. A simple gear shift provides two selective swing speeds to best synchronize with the arc of swing and height of lift for increased output. Two traction speeds give greater power in tough going and faster speed in easy traveling. Positive steering for any angle is easily accomplished from the lever position in the cab. Full vision from the cab operating position assures maximum production. Safety glass protects the operator. Convenient and free accessibility of all parts is a definite time-saver when adjustments are necessary; each shaft can be independently removed; drums are equipped with quickly removable barrels; gears are enclosed and run in oil bath; and anti-friction bearings eliminate power waste.



High speed, light weight ¾ yd. shovel

Multi-Wash Dust Collector

THE CLAUDE B. SCHNEIBLE CO., Chicago, Ill., is introducing the Junior multi-wash dust collector. This new model possesses the same major operating advantages as the Senior multi-



Improved dust collector.

wash dust collector except that dirty air, gases, or fumes are scrubbed five times by an impingement plate arrangement instead of 13 times as in the larger model.

Dust and fume-burdened air is drawn into the bottom of the tower of the Junior multi-wash dust collector. Heavier particles are immediately deposited in the sludge cone. The air is drawn upward through a turbulent spray of water, passing over two sets of impingement plates in its ascent, and then precipitated to the sludge cone at the bottom of the tower. Air is dewatered by an entrainment separator and discharged. Sludge in the cone is pumped to a multi-louver, dewatering tank where the water is thrown off and recirculated. The Junior multi-wash dust collector has been designed primarily for single function operations such as: mold shake-out devices, mullers, pulverizers, crushers, spray booths, molding stations, sand conditioning units, sifters and separators, packaging machines, driers, grinders, and innumerable other places in industry where it is desired to clean up a single operation of a small room area. It can readily be converted into a Senior model by inserting a single section in the tower, containing additional impingement plates.

Improved Magnesite Brick

HARBISON-WALKER REFRACTORIES CO., Pittsburgh, Penn., is now supplying an improved form of steel-encased magnesite refractory brick, known as H-W Improved Metalkase. The brick itself is of chemically-bonded magnesite, providing high refractory qualities and resistance to corrosive basic slags. After being molded to accurate size under very heavy pressure, each brick is encased on three sides in a "form fitting" jacket of mild steel. As these bricks are generally laid as headers, this means that the furnace wall or lining will be built up with each brick completely steel jacketed except at the ends. At the operating temperatures, the ends of the steel jackets at the heated face oxidize and melt, fusing with the brick itself to form a monolithic surface. However, at a short distance back from the hot face the steel remains intact, adding to the resistance of the wall to spalling influences and to the internal strength of the entire structure.

Shovel with Welded Boom

LINK BELT CO., Chicago, Ill., has designed and built a crawler shovel equipped with new all welded boom and dipper stick. The boom is 36 ft. long, and the stick 28 ft. long. This shovel has a greater reach than the former designs with 35-ft. boom and 21-ft. stick. The bottom end of the boom is flared so as to eliminate "hog rods" and afford greater stability and strength. In spite of this greater strength and size at the bottom of the boom, the welded design weighs 10 per cent less than the old riveted design. It is said to be twice as strong and costs approximately 20 percent less. The welded design also has permitted the use of a larger sheave (48 in. in diameter) because of the greater strength and rigidity at the sheave end of the boom. The welding was done with shielded arc equipment supplied by The Lincoln Electric Co., Cleveland, Ohio.

Crawler shovel with all-welded boom and dipper stick.

Diesel-Powered Compressor

FAIRBANKS, MORSE & CO., Chicago, Ill., has developed a new self-contained, Diesel-powered, 210-c.f.m. air compressor, available with several types of

Self-contained air compressor.

portable and semi-portable mountings, for a wide range of service applications. This new compressor combines the economy and dependability of the F-M Model 36-A Diesel with the design features of a proved air compressor, making available a compact, lightweight unit that offers maximum efficiency and reliability under all working conditions. It is designed to operate at full engine speed, permitting direct-connection to the Diesel engine without reduction gears or belts and without sacrificing engine horsepower through reducing the rated speed. The F-M Model 36-A, four-cycle, six-cylinder, medium-high speed Diesel engine is compact, and is designed to permit easy inspection and servicing. The new Diesel-powered air compressor is available with several types of mounting; wooden skid, steel wheel, solid or pneumatic rubber tired wheel, four- or two-wheeled trailer, and motor or railway truck.

WEST COAST ACTIVITIES

By GEO. D. ROALFE

Los Angeles, Calif.

REPRESENTATIVES OF 25 CONCRETE UNIT MANUFACTURERS met on September 2, at the Hotel Leamington, Oakland, Calif., to discuss problems affecting their industry. During the morning session they were instructively entertained by Architect and Engineer Walter G. Steilberg who gave a talk on Modern Construction, illustrated by slides.

He traced recent trends in architecture, pointing out the revolutionary change which began with the introduction of steel and the constant effort which was everywhere to be seen, tending toward the simplification of construction and lessening of dead loads. At that time hollow units, composed of various materials, appeared in answer to the demand for light filler walls. The use of concrete units, in lighter construction, he considered, a relatively new development, subject to wide expansion, provided definite standards of uniformity and quality were established and maintained. He advocated specifications based on ultimate requirements rather than on detailed methods of manufacture.

Efforts, based on group action, he felt should be made to obtain the highest resistance to climatic changes and lateral forces. Proper curing and erection methods, he felt, were of tremendous importance in their effect on the growth of the concrete unit industry. He particularly advised that all foundations built to receive concrete block walls be carried down to a point of uniform moisture content or below the frost line where freezing hazards were likely to occur. Such treatment would reduce shearing and cracking difficulties to a minimum.

New Association Formed

In the afternoon, after a general discussion, a non-profit organization was formed to promote the interests and use of concrete units and to provide means for standardization efforts. The name California Concrete Masonry Association was adopted. The by-laws of the National Concrete Masonry Association were tentatively adopted, subject to such modification as experience might dictate. Officers were to comprise an executive committee composed of three members, representing respectively the northern, central and southern portions of the State, presided over by a chairman selected from their membership by the committee, and a secretary-treasurer.

Officers elected were: A. G. Streblow, of the Basalt Rock Co., Napa; H. W. Chutter of the Jourdan Concrete Pipe Co., Fresno; and Hugh Fillmore of the Fillmore Cement Products, Inc., North Hollywood, to serve as the Executive Committee with Mr. Streblow as chairman and Sterling Carter, architectural field representative of the Portland Cement Association as secretary-treasurer. Applications for membership were received from all manufacturers present, and a campaign was initiated to interest all qualified producers in the Association. Information relative to the work of the Association is obtainable from the secretary, located at 564 Market Street, San Francisco, Calif.

The session closed with a showing of a motion picture, with comments by Stephen Flam, of methods used in producing concrete units with Indian labor on western Reservations for the United States Indian Service. A total output of more than 2,000,000 units, used in the construction of 175 buildings, were manufactured with his machines on this work. M. L. White of North Hollywood followed with a motion picture, illustrating a machine for making concrete units.

Drainage Tile

OSCAR H. SCHMIDT CONCRETE PRODUCTS Co., St. Joseph, Mo., has erected a plant at Bethany, Mo., specifically for making tile for a highway contract, but may turn it into a permanent plant.

Charges Denied

FEDERAL TRADE COMMISSION has made public the replies of about 60 cement manufacturers and the Cement Institute to a complaint charging a combination to eliminate price competition. All of the replies received by the commission denied the existence of a combination to fix prices. "Identity of prices does not indicate the absence of effective competition in the marketing of cement," Universal Atlas Cement Co. said. "Cement is a standardized product made under standard specifications and accordingly the buyer will purchase from whom he can secure cement at the lowest price delivered at destination. The result is that all producers quoting at a given destination must meet competition by matching the lowest price quoted at that destination."

New Office-Laboratory

LONE STAR CEMENT CORP., Pennsylvania division, Nazareth, Penn., is building a new office and laboratory, of reinforced-concrete with walls of cinder-block, random ashlar.

New Quarry

CEDAR RAPIDS CONCRETE MATERIALS Co., Cedar Rapids, Ia., is opening a quarry near Iowa City, Ia., to supply crushed stone for 55 miles of secondary county roads.

Plant Completed

UNITED STATES GYPSUM Co., Chicago, Ill., has completed a new wall board plant at its Heath, Mont., operation, 8 miles from Lewistown. The new building is concrete and steel and replaces a plant destroyed by fire last winter. The brick building in the foreground in the accompanying illustration is the gypsum calcining and grinding plant constructed about a year ago.

Lewistown Democrat **U. S. Gypsum Co. plant, Heath, Mont.**

THE INDUSTRY

New Incorporations

Carroll Sand & Gravel Corp., Buffalo, N. Y., incorporated for $100,000 by Ray, Gardner & Trebie, M. & T. Building, Buffalo, N. Y.

Cotton State Portland Co., Jackson, Miss., has been granted a charter with an authorized capital of $1,500,000.

Glen Allan Gravel Co., Inc., Greenville, Miss., incorporated by A. M. Arpin, and O. Arpin. Authorized stock is $10,000 comprising 100 shares common stock having a par value of $100. Organized for the purpose of buying and selling sand and gravel, leasing lands and operating gravel pits, to own and operate machinery and equipment customary to the operation of the gravel business.

Hollins Stone Corp., Hollins, Va., has been organized with a capital stock $12,000 by W. B. Hughes and Philip Kohen.

Kentucky Fullers Earth Co., Paducah, Ky., incorporated under the laws of Kentucky by K. O. Grassham, R. A. Hale, Jr., and A. L. Sloan, with a capital of $50,000.

Miami-Colite Rock Co., Miami, Fla., 1000 shares of $10 par value; Robert F. Underwood, Ingraham Bldg.; Doris A. Burdick.

New Argyle Cement Block & Excavating Co., Inc., Newark, N. J., 100 shares of common stock no par value. For further details communicate with agent, Samuel J. Zucker.

Pandolph Quarries, Inc., Needham Heights, Mass., capital 500 shares of no par stock. Incorporators are Antonio Pandolph, Paul Pandolph and Harry Pandolph all of Needham.

Standard Minerals Corp., 77 West Washington St., Chicago, Ill. Incorporators are C. K. Rubin, M. Murphy, and B. Davis. Organized for the purpose of mining and marketing of minerals, etc. Correspondent: Clifford K. Rubin, 77 West Washington St., Chicago, Ill.

Susquehanna Quarries, Inc., Conowigo, Md., Incorporators are Milton Brause, and George F. Reid.

Tersana Brick and Ceramic Manufacturing Co., Ltd., Wilmington, Del., with authorized capital of $300,000 to deal in clay, kaolin, silica, gravel, and stone. Incorporators are: J. M. Frere, J. A. Frere, and C. R. Murphy of Wilmington.

Personals

Lyle Ballantyne, who has been in the concrete business in Omaha, Neb., for the past ten years, has joined the official family of the Red-D-Mix Concrete Co., according to manager Elmer Rosengren.

H. D. Barnes has been appointed regional highway engineer of the Portland Cement Association at San Francisco. Prior to his recent appointment, Mr. Barnes had been State Highway Engineer of Kansas with headquarters in Topeka, Kan., and before that had been regional engineer at Chanute. He was also chief of the highway planning board, a federal service affiliated with the State Highway Commission.

Obituaries

Artemas B. Bigelow, a pioneer cement mill organizer and builder widely known throughout the East, died on September 7 at the age of 82. He was superintendent of the first cement mill built along the Rondout Creek at Wilbur, N. Y., known as the Wallkill-Portland Cement Co. During his long career in the cement industry, Mr. Bigelow was active in organizing some of the largest cement plants in the country. At one time he was superintendent of the Alpha plant at Whitaker, N. Y., and he also organized and built the Vulcanite Cement Mill at Vulcanite. While prospecting for Thomas A. Edison, he discovered a high calcium limestone bed at Stewartsville, N. J., which proved to be very valuable.

Joseph L. Byers, owner of the Vincennes Sand and Gravel Co., Vincennes, Ind., died on August 2, at the age of 62. Mr. Byers gained considerable prominence several years ago when he developed a porous tile.

Morgan Curtis, Petosky, Mich., president of the Northern Lime Co., died September 11 from a heart attack. He was active in banking and business circles of his home city in addition to his duties with the lime company. Until recent years he had taken an active part in the National Lime Association.

Col. William G. Hudson, who was prominently identified with the immense highway construction program carried out by Louisiana under the late Governor Huey Long's regime, died September 10 at Covington, La., at the age of 60. Col. Hudson was appointed colonel on the staff of Governor Long, and was reappointed to the same office on the staff of both Governor Allen and Governor Noe. He was a well-known figure in the cement industry.

Frank W. Kermott, for many years manager of the Milwaukee Sand and Gravel Co., died of a heart attack on August 29, at 78 years of age. Mr. Kermott came to Milwaukee more than 50 years ago, and spent most of his life working for sand and gravel companies until he retired five years ago.

J. G. Kyle, president of the Atlanta Concrete Pipe Co., drowned September 5, when he fell from a fishing boat in the Gulf of

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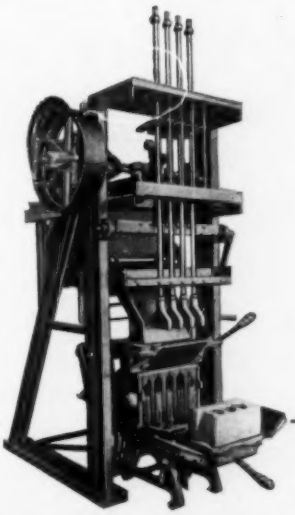

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Complete equipment for making concrete, cinder and other light weight aggregate units, including engineering service for plants and revamping of old ones for more economical service.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Blystone mixers and others.

Anchor Concrete Mchy. Co.
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The Poidometer is self-contained. The scale beam is graduated in pounds or kilos, and can be set at whatever amount of material may be required per foot of belt travel; the gate is then adjusted to suit this weight, and the machine will deliver the pre-determined amount of material with an accuracy of ninety-nine per cent.

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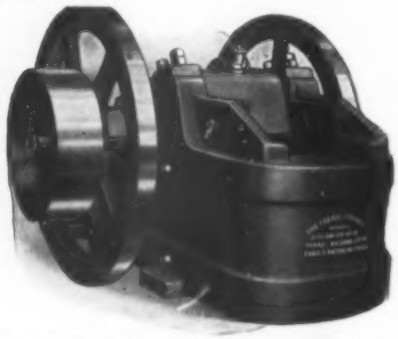


EARLE C. BACON, Inc.
17 John Street New York, N. Y.

Mexico. His brother J. Vernon Kyle, recovered the body. Mr. Kyle, who was only 42 years old at the time of his death, lost his life while on a fishing expedition with a large circle of friends and business associates who included, besides his brother, W. K. Kimbrough, sales manager of the pipe company.

Clifford A. Owens, president of The Osgood Co., Marion, Ohio, died on July 28 from uremic poisoning. Mr. Owens' passing will leave an unfillable gap in the memory of his associates, having been the president and guiding spirit and untiring worker for The General Excavator Co., The Commercial Steel Casting Co., The Alloy Cast Steel Co., The Hercules Co., The Power Manufacturing Co., and The Engineering Equipment Co., all of Marion, as well as The Osgood Co. Mr. Owens and his father, John D. Owens, who died in 1929, acquired a controlling interest in The Osgood Co. in the early days of its operations. Since maturity he has been active in the shovel and excavator manufacturing field and, in point of service, was probably the oldest executive in that particular industry. He was also prominent in the production of steel castings, both by the open hearth and electric process. He was also in the quarry business at one time.

Michael Ross, president of the Ready Mixed Concrete Co., Kansas City, Mo., died August 31 at the age of 77, following a stroke. Mr. Ross was widely known in the Southwest among sand, gravel and crushed stone producers, and for 45 years was associated both in business and politics with T. J. Pendergast, Democratic leader, who also is a vice-president of the Ready Mixed company.

Crushed Stone

Fairfield, Iowa: Preliminary work in relocating the Jefferson County quarry from its old location near Glasgow to a point approximately 12 miles northwest of Fairfield, has been completed. The new location is on Mrs. Lewis Grundon's land in the northwest quarter of Section 3, in Lockridge township. After the old quarry at Glasgow is cleaned up, the crusher and other equipment will be moved to the new location.

Whitewater, Kan.: H. Chas. Stephens has started quarrying and crushing operations in his new plant five miles northwest of Whitewater. The limestone bed, which has been analyzed at 90.6 percent calcium carbonate, lies near the surface and averages 4-6 ft. thick. Road chat, commercial mix, and agricultural limestone grades are produced. The crusher is a 9x16 Erhsam type.

Memphis, Mo.: For the purpose of opening a quarry, the county court has authorized the lease of a tract of land on the John W. Boley farm near this city. The quarry will be operated with WPA labor. About 1200 yd. of rock will be quarried to determine whether there is sufficient rock to justify the purchase and operation of a crusher. The rock is to be used to surface county roads.

Fort Madison, Iowa: Stripping operations have been completed at the Polhans quarry which recently was acquired by the City of Fort Madison as a source of rock supply to be used in a city park project. A WPA quarry crew from the Lutz quarry has been moved to the new Polhans quarry as the hauling distance is shorter.

Winona, Minn.: A 15-x24-in used rock crusher has been purchased by the Winona County Board of Commissioners. The crusher had been in use on a rental basis for three months, having been obtained for a WPA project which required immediate employment of relief workers.

Fairfield, Iowa: Limestone quarry operations have been started by the Hammill Stone Co., located on the Sam Core land east of Fairfield on Route No. 34. The new quarry is being operated by E. Merle Hammill of Centerville and R. G. Lindsay of Fairfield. Crushed stone for road construction and agricultural limestone is being produced.

Manufacturers

Oliver United Filters Inc., New York, Chicago and San Francisco, announces the appointment of E. Corning Faber to its sales engineering staff. Mr. Faber has had many years filtration experience and was formerly associated with Filtration Engineers, Inc.

Waukesha Motor Co., Waukesha, Wis., has acquired the services of Cecil E. White, formerly sales manager for the Milwaukee Division of the Standard Oil Co., in its Gas Power Division. His technical training consists of work as an instructor in Agricultural Engineering at the university and in Automotive Engineering at the American School of Correspondence in Chicago. During this time he also assisted in the revision of texts and a cyclopedia on automotive engineering. Subsequent technical experience was gained as a service engineer for the Allis-Chalmers Manufacturing Co.

Westinghouse Electric International Co., East Pittsburgh, Penn., has made several appointments. G. Blocksidge, who becomes assistant vice president, started with the company in 1906 following his graduation from the Virginia Polytechnic Institute with a degree in electrical engineering. He has been located at a number of the Westinghouse offices, including London, where he was chief engineer. He is succeeded as Manager of Central Station and Transportation Division by R. D. McManigal.

Mr. McManigal joined the company in 1915, after he graduated from Lafayette University with a degree in electrical engineering. In 1922 he went to Japan as a Railway Specialist for the company. He is well qualified for his position, having been assistant to the manager of the same division since 1931.

Having graduated from the University of Pittsburgh in electrical engineering and business administration, H. S. Reizenstein is a well chosen appointee for the position of contract manager.

D. C. Brooks has been appointed sales promotion manager of Westinghouse. He received his education in England, and in 1928 entered the Merchandising Division in this country. He was later connected with the London office where, in addition to his activities in England, his work took him to France, Algeria, Morocco and Tunisia.

All of the newly appointed officials will have their headquarters at 150 Broadway, New York, N. Y.

Worthington Pump and Machinery Corp., Harrison, N. J., has appointed W. H. Scherer, manager of the plant at Holyoke, Mass., in charge of the manufacture of equipment. He was recently transferred from the corporation's plant at Harrison, N. J.

Trade Literature

The following literature, recently published, is available free, upon request to the respective sponsor:

Portable Crushing and Screening Plants, types 70, 80 and 100 are described and profusely illustrated in two new bulletins issued by THE AUSTIN-WESTERN ROAD MACHINERY CO., Aurora, Ill.

Compressors, both portable and stationary, of new design, are described in an eight-page bulletin, No. 762, entitled, Diesel Engine-Driven Compressors, Class WO-2 portable type and Class W-CO stationary type. CHICAGO PNEUMATIC TOOL CO., Chicago, Ill.

Explosives and Uses to Which They Are Adapted are tabulated and described in a service bulletin recently issued by the E. I. DU PONT DE NEMOURS & CO., INC., Wilmington, Dela.

Cranes, Diesel and Gasoline Locomotive,

ranging in capacity from 10 to 50 tons are illustrated doing all kinds of bucket, hook, and magnet work in an informative 12-page booklet. INDUSTRIAL BROWNHOIST CORP., Bay City, Mich.

Turbo-generator units, condensing reaction type, of 1500 kw. to 5000 kw. capacity are set forth in a 28-page bulletin No. 1180. This bulletin treats both turbine and generator construction in considerable detail, and also has numerous views and drawings which illustrate various interesting features of this equipment. ALLIS-CHALMERS MFG. CO., Milwaukee, Wis.

Headlights, for mine locomotives, incandescent, are illustrated in an informative bulletin, GEA-2640, recently printed by GENERAL ELECTRIC CO., Schenectady, N. Y.

Recuperators for rotary kilns, Vanderwerp types CI and I, are depicted in various details in catalogue No. VR-37 which also gives some interesting information regarding this equipment. MANITOWOC ENGINEERING WORKS, Manitowoc, Wis.

Standard Screen Scale and information about testing sieves and the Ro-Tap testing sieve shaker may be found in bulletin 726. THE W. S. TYLER CO., Cleveland, Ohio.

Plain Pallet Strippers are described and illustrated in a recent bulletin issued by the BESSER MFG. CO., Alpena, Mich.

Woven Wire Fabrics catalog, 1937 revisions, with many interesting tabulations giving wire gage sizes and other pertinent information has been made available by JOHN A. ROEBLING'S SONS CO., Trenton, N. J.

New Distributor

WHITEHEAD-COMLEY, INC., 5600 Grays Ave., Philadelphia, Penn., is the name of a new firm which handles the rental and sale of new and used construction and rock products equipment. The plant also operates a plant for rebuilding of all types.

G. A. Whitehead, president of the new company is the Philadelphia distributor for the Owen Bucket Co., and owns and operates Maris Brothers, Inc., builders of overhead electric and hand-operated traveling cranes. Mr. Comley was previously associated with the Equipment Corp. of America at their Philadelphia office.

New Plant

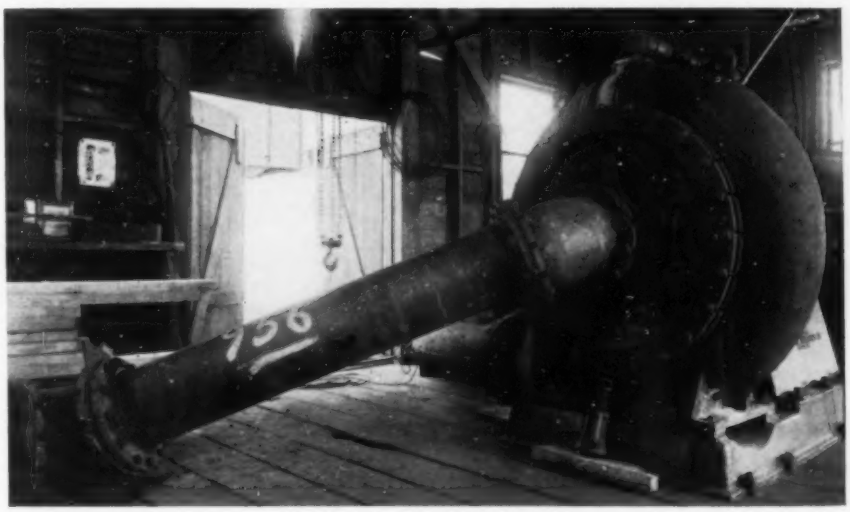
NATIONAL GYPSUM CO., Buffalo, N. Y., will build a plant at Mobile, Ala., to make fibre board and other products. Local business men subscribed $50,000 as an inducement to locate the plant in Mobile.

Rubber-Lined Pipe for Dredge Suction

AN INTERESTING INSTALLATION of a rubber-lined pipe was recently made on the suction side of a Bennett centrifugal pump located on the dredge of the Rubber City Sand and Gravel Co. at Akron, Ohio. The pipe, which is 12 in. in diameter and 5 ft. 10 in. long, is lined with ¼-in. Armorite, a special abrasion-resisting rubber developed by The B. F. Goodrich Co., Akron, Ohio, and replaces a similar length of Armorite line placed in service three years ago.

Material flowing through this pipe ranges in size from sand to 5-in. rocks. The percent of solid is usually maintained at about 20 percent. With the material moving at approximately 17 ft. per second under 30 to 40 lb. pressure, the pipe handles on an average of 2000 tons of sand and gravel per working day.

The section of rubber-lined pipe, which was replaced on August 14 of this year, was originally installed on August 1, 1934. Allowing for those winter months, during which time it is impossible to operate the dredge due to ice, the pipe had actually been in use 20 months, or three seasons. When ordinary steel pipe was used at this position it had to be replaced, due to wear, on an average of three times per season.



Rubber-lined sand and gravel pipe

You can tell by looking at its lower sheave design that a

HI-POWER

is a bucket that will keep the closing line UP out of the muck, save jammed sheaves and move yardage at a profit.

It's a **REAL** Bucket — At a **RIGHT** Price

Ask for Bulletin 237 on Famous Hi-Power Clamshell Buckets

Write, Wire or Telephone

HAISS

George Haiss Mfg. Co., Inc., Park Ave. & 143rd St., New York

Who, for over 40 years, have created and sold none but equipment of demonstrable superiority in design and manufacture.

Portable Conveyors—Revolving Screens

YEARS

OF EXPERIENCE AND SKILL

. . are reflected in Jeffrey units for processing and handling in the stone products industry. Cost records from all parts of the world give convincing testimony to the money-saving character of Jeffrey crushers, elevators, conveyors, feeders, screens, chains, dewaterers, loaders and unloaders.

Regardless of your needs or location, Jeffrey engineers . . choosing from a complete line of proved material handling and reduction equipment . . know how to provide for reliability under severe conditions, and are skilled in fitting the units to flowsheet requirements. They will furnish equipment to give you the least trouble in operation and maintenance.

Call on Jeffrey.

The Jeffrey Manufacturing Co.

935-99 N. Fourth St., Columbus, Ohio

Prices Bid—Contracts Let

JEFFERSON, OHIO: Resolutions were recently passed by the county commissioners accepting a bid by Troyer Construction Co., Aurora, Ohio, for graveling 9½ miles of road. The Troyer bid was for 14,800 cu. yd. at $5,700 or 38c per cu. yd. This was the largest graveling job ever let by the county. Acceptance also was made by the commissioners of Kelly Island Lime and Transportation Company's bid on 1,240 cu. yd. of heavy slag and 135 cu. yd. of fine slag at $2,681.25 or an average price of about $2 per cu. yd.

LIMA, OHIO: Bids have been received by the Lima Municipal board of control for stone to be supplied from September, 1937 to August, 1938. Companies submitting bids and the prices are as follows: Raabe Stone Co., Ft. Jennings, 60, 80, and 90c a ton, according to type desired, delivery 20c a ton additional; American Stone Corp., Lima, 82 cents a ton delivered, spread or stocked; Delphos Quarries Co., 60, 80, and 90c a ton, according to type, and 20c a ton added for delivery.

LOS ANGELES, CALIF.: The City of Los Angeles, Department of Water and Power, awarded a $20,000 contract on August 31, for one year, to the Blue Diamond Corp., Los Angeles, to furnish concrete aggregates to the Department.

OAKLAND, CALIF.: Contract has been awarded to W. S. Thomas, Berkeley, for 101 tons of stepping stone, lichen covered basalt, at $20 a ton. The award was made by the State Procurement office, U. S. Treasury Department, San Francisco.

INDIANAPOLIS, IND.: The State Highway Commission of Indiana has placed orders for crushed stone at $1.69 per ton with the Erie Stone Co., Indianapolis, for State Road 250. Tonnage and sizes are as follows: 500-1000, size 4, 95 percent crushed; 500-2000, size 8F, 100 percent crushed; 500-1,500, size 11, 95 percent crushed.

CUDAHY, WIS.: Lake Shore Sand & Stone Co., Milwaukee, was awarded a contract by the City of Cudahy for 2200 tons of crushed stone at $1.42 per ton.

MILWAUKEE, WIS.: Cook & Brown Lime Co., Oshkosh, Wis., has received the award of the U. S. Engineers for 2300 tons of sand and 3900 tons of gravel at $1.60 per ton.

DENVER, COLO.: The Bureau of Reclamation has awarded to the Monolith Portland Midwest Co., Laramie, Wyo., the contract for 43,000 bbl. of modified sulphate-resistant or standard portland in cloth sacks for Shoshone Canyon Conduit and Heart Mountain Canal, Heart Mountain division, Shoshone project, at $2.58 per bbl. Delivery is f.o.b. cars at shipping point or f.o.b. cars Cody, at option of the bidder.

CHATSWORTH, ILL.: Churchill Gravel Co., was recently awarded a contract by the village board to gravel the streets of Chatsworth at its bid of $1.10 a cu. yd.

DENVER, COLO.: Bureau of Reclamation has announced the award of contracts for 200,000 bbl. of low-heat portland cement to two companies; the Trinity Portland Cement Co., Dallas, Tex., for $365,750, and Republic Portland Cement Co., San Antonio, Tex., for $154,500. This is at an average price of $2.60 per bbl. The cement is to be delivered f.o.b. cars at shipping point or f.o.b. cars, Rutledge, for use in the construction of Marshall Ford Dam, Colorado River Project.

OMAHA, NEB.: Tobin Quarries, Inc., Kansas City, Mo., has been awarded a contract for 1,800 tons of asphalt mixture at $16.66 a ton by U. S. Engineers for City Hall construction project in Omaha.

SACRAMENTO, CALIF.: The State of California has placed a contract with Hutchinson Co., Oakland, for 3500 tons of screenings at $2 per ton, f.o.b. Suisun, Vacaville, Dixon and/or Batavia. It also awarded a contract to J. M. Nelson, Cordelia, for 4000 tons screenings, via dump truck, f.o.b. state spreader on job between Benicia and Cordenia, at $1.85 per ton, ¾ x 1½ in. coarse; $1.95 per ton, ¼ x ½ in. medium; and $2.20 per ton, ⅛ x ¼ in. fine.

SAN FRANCISCO, CALIF.: The City of San Francisco has awarded a contract for 600 cu. yd. of ready mixed concrete to South City Lumber & Supply Co., South San Francisco, at $7.97 per cu. yd. It is to be used for the San Francisco Airport.

INDIANAPOLIS, IND.: Contracts for crushed stone have been awarded by the Indiana Highway Commission for 700-1500 tons, size 8F, and 200-300 tons, size 11, 100 percent crushed, equally divided between Ohio and Indiana Stone Co., and Midwest Rock Products Co., both of Indianapolis, at $1.80 per ton f.o.b. Knightstown. The commission also ordered 800-1500 tons, size 9, 100 per cent crushed stone, from Taylor Frye, Campbellsburg, at $1.85 per ton, delivered to State Road 56, Section F.

Lucky Break!

SUPERIOR PORTLAND CEMENT, INC., Concrete, Wash., plant had a narrow escape from spoiling a long no-accident record on August 20, when part of an unexploded charge in the quarry was set off by a shovel. The blast was made August 12, and so far as any one knew all the charge had been exploded. In loading rock from the blast on August 20 the shovel handled a boulder with an unexploded fragment of the charge still in it. Fortunately no one was more than scratched.

Up 16 Percent

CANADA CEMENT CO., LTD., Montreal, Que., business for the seven months ended June 30 was 16 percent above the same period ended June 30, 1936. Reported shipments during first three weeks of July were maintaining the higher level noted for the half year. Shipments as at June 30 were running about 20 percent over the like period of 1936 with export business continuing to advance. While a falling off in public works took place, the outlook is favorable due to increases in private construction.

Still Kick About Dust

COWELL PORTLAND CEMENT CO., Cowell, Calif., which recently installed dust collectors under court orders, is still experiencing trouble with its neighboring farmers because of alleged dust—even though the dust arrestors are claimed to be 90 percent efficient.

Closed Again

WABASH PORTLAND CEMENT CO., Detroit, Mich., is reported locally to have closed its plant at Stroh, Ind., August 17, after only two months' operation. The plant is an old one and is assumed to have been operated temporarily to relieve the peak load on the company's new modern plant at Osborn, Ohio.

Phosphoric Acid

VICTOR CHEMICAL CO., Chicago, Ill., has let a contract to the Stone and Webster Engineering Co., Boston, Mass., for construction of a $1,000,000 plant to make phosphoric acid from phosphate rock in an electric furnace, at Columbia, Tenn.

Black-Top Plant

WEST VIRGINIA BLACK ROCK CO., Charleston, W. V., has completed a new plant at 8 West Spring St. to make black-top, asphaltic paving material. A. G. Anderson, formerly of Columbus, Ohio, is sole owner.

Wage Increase

CENTRAL SILICA CO., Glass Rock, Ohio, is reported to have raised wages recently 6c per hr.

HOW THE G.T.M. TAMED the belt-breaking fuller mill drives

TROUBLE WAS THE FIRST, last and middle name of these two fuller mill *drives* in a large eastern chemical works.

FASTENERS PULLED OUT on an average of once a month under the shock loads and stretch had to be cut out at frequent intervals. Constant fraying by riding up against the motor frame was another difficulty, while a severe abrasive dust condition made large and regular applications of dressing necessary to keep the drives functioning.

ONE YEAR'S SERVICE was the maximum being obtained from the highest quality ply belts, six months the average and that only with considerable nursing, when the plant superintendent told his troubles to the G.T.M.—Goodyear Technical Man.

ON THE G.T.M.'S RECOMMENDATION a Goodyear COMPASS "51" Belt was applied on No. 1 mill on November 2, 1935 and on No. 2 mill on February 16, 1936. To end the fastener difficulty both belts were made endless on the drive by Goodyear's patented vulcanized splice. To overcome the dust both belts were made with an inner ply of Goodyear's new 3-R friction surface whose permanent high adhesion makes it possible to operate heaviest drives at 25% to 50% lower tension.

TODAY, ALMOST TWO YEARS LATER, both belts are performing faultlessly and have never required a single repair. COMPASS' balanced true-running construction has eliminated riding up on the pulleys. In all this time no dressing has been necessary except *one* application of a special Goodyear-prepared compound to the surface of No. 1 belt after its first year's service. *The plant estimates that the saving in dressing cost alone has paid for the belts—while the saving in repairs is all gravy.*

THIS IS THE KIND of money-saving belt performance the G.T.M. stands ready to furnish on your hardest drives. To bring him to your office, write Goodyear, Akron, Ohio, or Los Angeles, California—or the nearest Goodyear Mechanical Rubber Goods Distributor.

All Set for Low-cost Production

with G-E Motors Assuring Continuous Operation

G-E motors driving equipment in the lime plant of H. E. Millard

THE new lime plant of H. E. Millard at Annville, Pa., is all set for the low-cost production of high-quality lime. The plant machinery is of the most modern, efficient design, and the G-E motors that drive it help to assure continuous operation.

Most of these motors, operated by G-E matched control, are standard open types. Experience has shown that even where there is dust and vibration, the strong frames and end shields, the unusually protective insulation on the windings, and other features of construction enable G-E standard motors to give dependable, economical service on the toughest kinds of jobs.

You may be considering installing new equipment in your own rock-products plant—such as that illustrated here or of a kind to fit your particular requirements. For complete information about the electric equipment to operate it, call the nearest G-E representative. General Electric, Schenectady, N. Y.

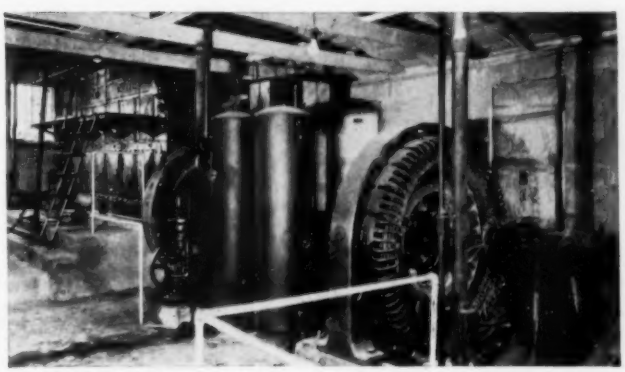
011-255

GENERAL ELECTRIC

Working on the "Rock Pile"..

Since 1934, this husky Superior Diesel has been working on the "rock pile", and it will continue to earn a good profit for its owner for years to come, in powering this quarry and crushing plant.

The dependability and operating economy of Superior Diesels in this service can be proved in your plant just as well as in the many other plants of this type now using them.



Narehood Brothers, Milton, Pennsylvania, coupled this 475 H. P. Superior Diesel to an old generator in their rock crushing plant.

Ask us to make a power survey of your plant. No obligation.

THE NATIONAL SUPPLY COMPANY
OF DELAWARE
SUPERIOR ENGINE DIVISION, SPRINGFIELD, OHIO
LOS ANGELES, CALIFORNIA PHILADELPHIA, PA.

Superior DIESELS

HEAVY DUTY MODELS: 50 to 810 H.P., 250 to 720 R.P.M. • HIGH SPEED MODELS: 15 to 150 H.P., 900 to 1800 R.P.M.

CASH *For Your Ideas* •

$150.00 in Prizes!

OPEN TO SUPERINTENDENTS AND PLANT OPERATING MEN

5 BIG PRIZES

First Prize	$50.00
Second Prize	40.00
Third Prize	30.00
Fourth Prize	20.00
Fifth Prize	10.00

It's Easy to Enter

Just send in your ideas on novel operating methods, short cuts or time savers which you have used during 1937. Write just enough to intelligently explain the subject. Use pen, pencil or typewriter. If possible illustrate with photograph, blue print or sketch.

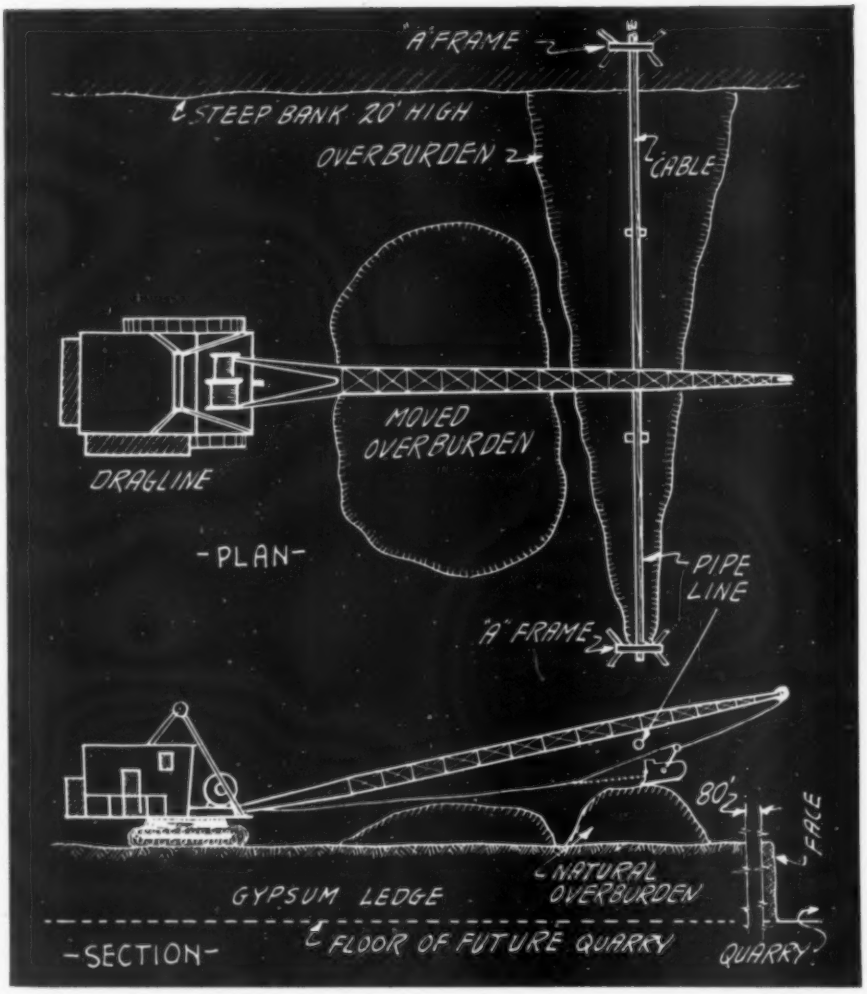
Articles will be judged primarily on the excellence of the idea and not on literary merit.

Examples

The illustration at the right together with the description won the second prize of $40.00 in 1936. The photo at the bottom illustrates another typical entry. For other examples look on the Hints & Helps for Superintendents pages.

START TODAY

Send your entry to the Editor of ROCK PRODUCTS before December 15, marked "ROCK PRODUCTS Hints and Helps Contest Entry."



Dragline working "over and under" the gas main removes overburden under it

Unloading box is dumped by suspension from ring at one end so that coal falls through open end

All Articles Used Will Be Paid For . . . . . .

Any Article submitted and found suitable for publication will be paid for at space rates of $5.00 per column of ROCK PRODUCTS, including illustrations.

This offer is open to all operating men in the industry, whether subscribers to ROCK PRODUCTS or not.

ROCK PRODUCTS
205 W. WACKER DRIVE
CHICAGO, ILLINOIS

They take hold

—and won't let go—

'til you "tell" them with a wrench

UNSHAKO

The Nut That Can't Shake Loose

Once the "Unshako" has been fully tightened, the locking ring positively prevents its backing off. It supplies a live, counteracting force within the nut that defeats vibration's efforts to shake it loose as effectively as could a giant hand's constant grip.

Yet . . . an ordinary wrench, applied without undue effort, will back-off the "Unshako" as smoothly as you please.

Every "Unshako" Self-Locking Nut is a self-contained unit . . . no extra washers, pins or other gadgets to bother with.

"Unshako" is the surest safeguard against accidents or operating loss due to nuts working loose.

Fill in and mail the coupon . . . get all the facts.

STANDARD PRESSED STEEL CO.

BRANCHES
BOSTON
DETROIT
INDIANAPOLIS

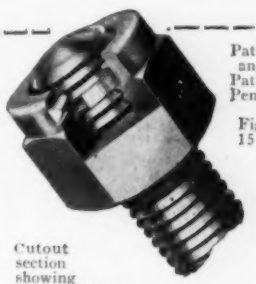
JENKINTOWN, PENNA.
Box 563

BRANCHES
CHICAGO
ST. LOUIS
SAN FRANCISCO

Gentlemen:
Send us more information about "Unshako"—

Mr. _____ Title _____

Firm _____ Address _____



Pat'd. and Pat's. Pending

Fig. 1510

Cutout section showing Locking Ring in place.

Classified Directory of Advertisers in this Issue of ROCK PRODUCTS

For alphabetical index, see page 126

Agitators, Thickeners and Slurry Mixers
The Dorr Co.
Hardinge Co., Inc.
F. L. Smidth & Co.

Aggregate De-dusters
Western Precipitation Co.

Air Compressors
Fuller Co.
Gardner-Denver Co.
Nordberg Mfg. Co.
F. L. Smidth & Co.

Air Filters
Fuller Co.

Air Filter Frames
Fuller Co.

Air Separators
Hardinge Co., Inc.
Raymond Pulverizer Division
Sly, W. W., Mfg. Co.
Sturtevant Mill Co.
Western Precipitation Co.
Williams Patent Crusher & Pulv. Co.

Airveyor
Fuller Co.

Alloys (Metal)
Chicago Steel Foundry Co.

Ash & Refuse Handling Equipt.
Allen-Sherman Hoff Co.

Backfillers
Bucyrus-Erie Co.
Lima Locomotive Works, Inc.

Balls, Grinding, (See Grinding Balls)

Balls (Tube Mill, etc.)
Allis-Chalmers Mfg. Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Hardinge Co., Inc.
F. L. Smidth & Co.
Traylor Engineering & Mfg. Co.

Bar Benders and Cutters
Koehring Co.

Batchers, Measuring Volume
Besser Mfg. Co.
Fuller Company
Jaeger Machine Co.

Bearings
Link-Belt Co.
Standard Pressed Steel Co.
Timken Roller Bearing Co.

Bearings (Anti-Friction)
Standard Pressed Steel Co.
Timken Roller Bearing Co.

Bearings (Roller)
Timken Roller Bearing Co.

Bearings (Tapered Roller)
Timken Roller Bearing Co.

Bearings (Thrust)
Timken Roller Bearing Co.

Belt Fasteners
Flexible Steel Lacing Co.

Belting
Boston Woven Hose & Rubber Co.
Robins Conveying Belt Co.

Belting (Metal Conveyor, High & Low Temperature)

Belt Lacing (Steel)
Flexible Steel Lacing Co.

Belting (Elevator and Conveyor)
Boston Woven Hose & Rubber Co.
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Belting (Transmission)
Boston Woven Hose & Rubber Co.
Gilmer, L. H., Co.
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Belting (V Type)
Gilmer, L. H., Co.
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Bin Gates
Allen-Sherman-Hoff Co.
Fuller Co.
Geo. Haiss Mfg. Co., Inc.
Industrial Brownhoist Corp.
Link-Belt Co.

Bins, Hoppers
Besser Mfg. Co.
Blaw-Knox Co.

Bins, Storage (Steel)
Besser Mfg. Co.

Blasting Cap Protectors
B. F. Goodrich Co.

Blasting Machines
Atlas Powder Co.

Blasting Supplies
Atlas Powder Co.

Blasting Powder (See Powder, Blasting)

Block Machines, Building
Anchor Concrete Machinery Co.
Besser Mfg. Co.
Stearns Mfg. Co.

Block Machines, Silo
Besser Mfg. Co.

Blocks (Pillow, Roller Bearing)
Link-Belt Co.
Standard Pressed Steel Co.
Timken Roller Bearing Co.

Blowers
Sly, W. W., Mfg. Co.

Bodies (Motor Truck)
Hug Co.

Boilers
Babcock & Wilcox Co.
Combustion Engineering Corp.
Jackson & Church Iron Wks.

Bolts
Standard Pressed Steel Co.

Boots and Shoes
B. F. Goodrich Co.

Breakers (Primary)
Smith Engineering Works
Traylor Engineering & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Brick Machines
Besser Mfg. Co.

Buckets (Clamshell, Grab, Orange Peel, etc.)
Blaw-Knox Co.
Geo. Haiss Mfg. Co., Inc.
Hayward Company
Industrial Brownhoist Corp.
Link-Belt Co.
Owen Bucket Co.
Wellman Engineering Co.

Buckets (Dragline and Slackline)
Blaw-Knox Co.
Bucyrus-Erie Co.
Owen Bucket Co.
Wellman Engineering Co. (G. H. Williams)

Buckets (Dredging and Excavating)
Geo. Haiss Mfg. Co., Inc.
Owen Bucket Co.

Buckets (Elevator and Conveyor)
Hendrick Mfg. Co.
Industrial Brownhoist Corp.
Jeffrey Mfg. Co.
Link-Belt Co.
Pettibone Mulliken Corp.
Robins Conveying Belt Co.

Bulldozers
Blaw-Knox Co.
Koehring Co.

Cableways
Broderick & Bascom Rope Co. (Yellow Strand)
General Electric Co.
Link-Belt Co.
Sauerman Bros.
Wellman Engineering Co. (G. H. Williams)

Calcinators
Traylor Engineering & Mfg. Co.

Cap Crimpers and Fuse Cutters
Ensign-Bickford Co.

Caps (Blasting)
Atlas Powder Co.

Car Movers (Freight)
Appleton-Atlas Car Mover Corp.

Car Pullers
Link-Belt Co.

Cars (Dump)
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)

Cars (Quarry & Gravel Pit)
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)

Cars and Track, Industrial
Besser Mfg. Co.

Castings
Babcock & Wilcox Co.
Birdsboro Steel Fdry. & Mach. Co.
C. G. Buchanan Co., Inc.
Chicago Steel Foundry Co.
Eagle Iron Works (Grey Iron)
Link-Belt Co.
Timken Roller Bearing Co.

Cement Making Machinery
F. L. Smidth & Co.
Traylor Engineering & Mfg. Co.

Cement Paints
Tamms Silica Co.

Cement Process
Cement Process Corp.

Cement Pumps
Fuller Co.
F. L. Smidth & Co.

Central Mixing Plants (Concrete)
Blaw Knox Co.
Jaeger Machine Co.

Chain (Dredge and Steam Shovel)
Bucyrus-Erie Co.
Jeffrey Mfg. Co.

Chain (Elevating and Conveying)
Jeffery Mfg. Co.
Link-Belt Co.
Pettibone Mulliken Corp.

Chain Systems (Kilns)
F. L. Smidth & Co.

Chimney Block Machines and Molds
Besser Mfg. Co.

Chutes and Chute Liners
Earl C. Bacon, Inc.
Goodyear Tire & Rubber Co., Inc.

Clarifiers
The Dorr Co.
Hardinge Co., Inc.

Classifiers
Deister Machine Co
The Dorr Co.
Hardinge Co., Inc.
Link-Belt Co.
Nordberg Manufacturing Co.

Clips (Wire Rope)
Broderick & Bascom Rope Co. (Yellow Strand)

Coal Crushers and Rolls
Williams Patent Crusher & Pulv. Co.

Coal Pulverizing Equipment
Babcock & Wilcox Co.
Gruendler Crusher & Pulv. Co.
Hardinge Company, Inc.
Pennsylvania Crusher Co.
Raymond Pulverizer Division
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Collars (Shafting)
Standard Pressed Steel Co.

Colors, Cement
Geo. S. Mepham Corp.
Tamms Silica Co.

Compressed Air Hoists
Gardner-Denver Co.

Compressed Air Rock Drills
Cleveland Rock Drill Co.
Gardner-Denver Co.

Compressors (See Air Compressors)

Concentrators (Slurry, etc.)
Deister Machine Co
The Dorr Co.

Concrete Slab Raising Equipment (Mud-Jack)
Koehring Co.

Conveyor Belting (See Belting)

Conveyor Idlers and Rolls
C. O. Bartlett & Snow Co.
Jeffrey Mfg. Co.
Link-Belt Co.

Conveyors and Elevators
Earle C. Bacon
Besser Mfg. Co.
Fuller Company
Geo. Haiss Mfg. Co., Inc.
Industrial Brownhoist Corp.
Jeffrey Mfg. Co. (Vibrating)
Lewistown Fdy. & Mach. Co.
Link-Belt Co.
Robins Conveying Belt Co.
F. L. Smidth & Co.
Smith Engineering Works
Sturtevant Mill Co.
Williams Patent Crusher & Pulv. Co.

Conveyors (Hydro Vacuum)
Allen-Sherman Hoff Co.

Conveyors (Pneumatic)
Fuller Company

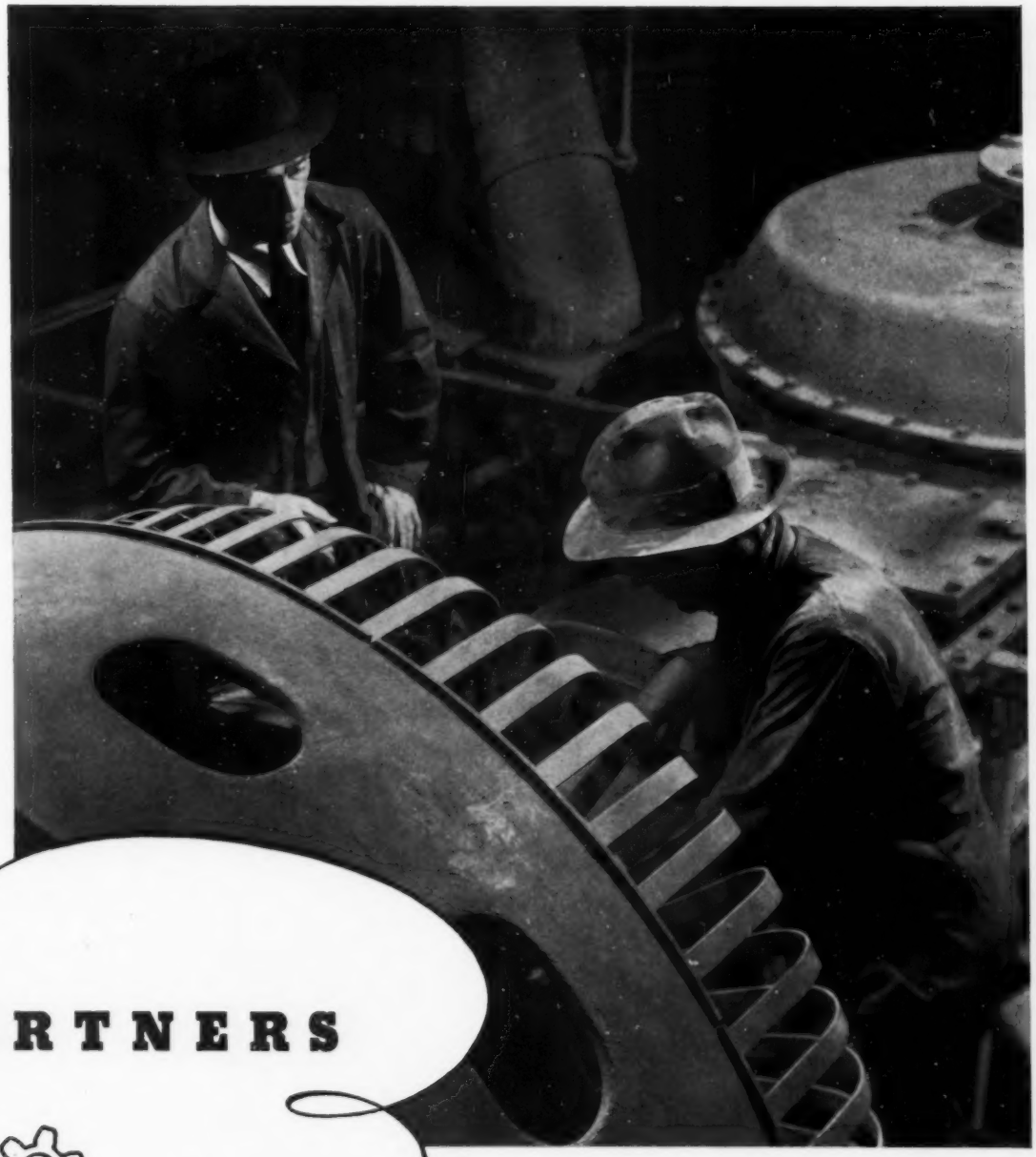
Conveyors (Screw)
Link-Belt Co.

Conveyors (Spiral)
Jeffrey Mfg. Co.

Correcting Basins
F. L. Smidth & Co.

Couplings (Air Hose)
Cleveland Rock Drill Co.

Couplings (Flexible and Shaft)
Link-Belt Co.
Standard Pressed Steel Co.



PARTNERS

THERE is a familiar scene in American industrial plants today—the Gulf lubrication engineer working in cooperation with a plant man who is responsible for production.

Both have a definite objective: To get the most efficient lubrication possible for every bearing, gear and moving part in the plant. So they "team up," pool their knowledge and experience in a united effort to defeat friction.

The Gulf engineer is well fitted to carry on this cooperative work. His entire time is spent in gaining and applying knowledge of oils and greases—to the end that machines may operate more efficiently and economically. He works with the plant operator, recommending the use of lubricants exactly suited to each moving part and suggesting the best methods of application.

Such careful attention to lubrication pays a generous reward in lowered costs for maintenance, and for power. And, better still, the results are further reflected in improved production from all plant machinery.

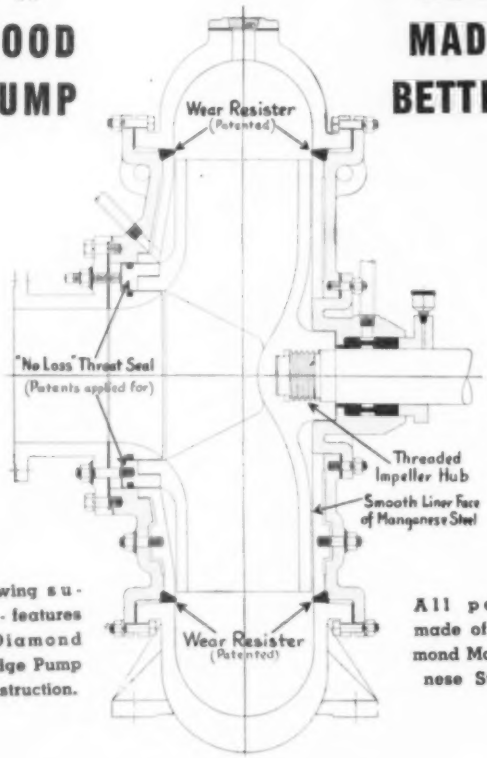
GULF INDUSTRIAL LUBRICATION

The Gulf line includes more than 400 quality oils and greases. The combination of this quality line of lubricants and Gulf's engineering counsel can help *you* attain maximum efficiency for every machine in *your* plant.

DIAMOND

A GOOD PUMP

NOW MADE BETTER



Showing super-features of Diamond Dredge Pump construction.

All parts made of Diamond Manganese Steel.

DIAMOND DREDGE PUMPS

now give their users even better performance because of newly developed features. Operators can now produce material at a still lower cost.

The patented "Wear Resister" protects pump shell, side plates and liners from wear at vital points. Threaded Impeller Hub or Bore gives greater impeller throat clearance and insures a true running impeller at all times. "No Loss" Throat Seal prevents internal leakage. P. M. Co. Products include Traveling Chain Cutter, Rotary Cutters, Elbows, Flap Valves, Nipples, Jaw Plates, Crusher Parts, Dippers, Dipper Teeth, Sheaves, and other Manganese Steel Products.

PETTIBONE MULLIKEN CORP.

4710 W. DIVISION ST. • CHICAGO, ILL.

Classified Directory—*Continued*

Couplings (Hose, Pipe, etc.)
B. F. Goodrich Co.

Cranes (Clamshell)
Bucyrus-Erie Co.
Koehring Co.

Cranes (Crawler and Locomotive)
Bucyrus-Erie Co.
Harnischfeger Corp.
Industrial Brownhoist Corp.
Koehring Co.
Lima Locomotive Works, Inc.
Link-Belt Co.
Michigan Power Shovel Co.
Northwest Engineering Co.
Thew Shovel Co. (Electric, Gas and Steam)

Cranes (Excavator)
Koehring Co.

Cranes (Overhead Traveling Electric)
Industrial Brownhoist Corp.

Crusher Parts
American Pulverizer Co.
Birdsboro Steel Fdry. & Mach. Co.
C. G. Buchanan Co., Inc.
Pennsylvania Crusher Co.
Traylor Engineering & Mfg. Co.

Crushers (Hammer)
American Pulverizer Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
The C. O. Bartlett & Snow Co.
Dixie Machy. Mfg. Co.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Pennsylvania Crusher Co.
Sturtevant Mill Co.
Williams Patent Crusher & Pulv. Co.

Crushers (Jaw and Gyratory)
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Lewistown Fdy. & Mach. Co. (Jaw)
New Holland Machine Co.
Nordberg Mfg. Co.
Pennsylvania Crusher Co.
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Crushers (Reduction)
Earle C. Bacon, Inc.
Birdsboro Steel Fdry. & Mach. Co.
C. G. Buchanan Co., Inc.
Jeffrey Mfg. Co.
Traylor Engineering & Mfg. Co.

Crushers (Ring)
American Pulverizer Co.

Crushers (Roll)
American Pulverizer Co.
Gruendler Crusher & Pulv. Co.
New Holland Machine Co.
Williams Patent Crusher & Pulv. Co.

Crushers (Rotary)
American Pulverizer Co.

Crushers (Single Roll)
American Pulverizer Co.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Link-Belt Co.
McLanahan & Stone Corp.
New Holland Machine Co.
Pennsylvania Crusher Co.

Crushing Rolls
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.
Jeffrey Mfg. Co.
New Holland Machine Co.
Pettibone Mulliken Corp.
Sturtevant Mill Co.

Dedusters
Blaw-Knox Co.

Detonators
Atlas Powder Co.

Dewatering Machines
The Dorr Co.

Diaphragms (Pump)
B. F. Goodrich Co.

Dippers & Teeth
Frog, Switch & Mfg. Co.
Pettibone Mulliken Corp.

Dippers and Teeth (Steam Shovel)
Bucyrus-Erie Co.
Thew Shovel Co. (Electric, Gas and Steam)

Dirt Moving Equipt. (Dumptor)
Koehring Co.

Ditchers
Bucyrus-Erie Co.

Draglines
Bucyrus-Erie Co.
Link-Belt Co.
Northwest Engineering Co.
Thew Shovel Co. (Electric, Gas and Steam)

Draglines (Gasoline or Electric)
Koehring Co.

Dragline Cableway Excavators
Bucyrus-Erie Co.
Link-Belt Co.
Sauerman Bros., Inc.

Dragline Excavators
Bucyrus-Erie Co.
Lima Locomotive Works, Inc.
Michigan Power Shovel Co.
Northwest Engineering Co.

Dragline Excavators (Electric, Gas and Steam)
Thew Shovel Co. (Electric, Gas and Steam)

Dredge Pumps (See Pumps, Dredging)

Dredges
Bucyrus-Erie Co.
Hayward Co.
Hetherington & Berner, Inc. (Complete Steel)
Morris Machine Works

Dredging Sleeves
B. F. Goodrich Co.

Drill Bits
Timken Roller Bearing Co.

Drill Sharpening Machines
Gardner-Denver Co.

Drill Steel
Cleveland Rock Drill Co.

Drills
Bucyrus-Erie Co.
Timken Roller Bearing Co.

Drills, Hammer (See Hammer Drills)

Drills (Rock)
Cleveland Rock Drill Co.
Gardner-Denver Co.

Drills (Tripod)
Cleveland Rock Drill Co.

Drills (Wagon)
Cleveland Rock Drill Co.

Drilling Accessories
Cleveland Rock Drill Co.

Drives (Short Center)
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.

Dryers
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Combustion Engineering Corp.
Hardinge Company, Inc.
W. S. Tyler Co.
Western Precipitation Co.

Dump Bodies (Truck)
Athey Truss Wheel Co.

Dumptors
Koehring Co.

Dust Arrestors
Sly, W. W., Mfg. Co.

Classified Directory—*Continued*

Dust Collecting Systems
Allen Sherman Hoff Co.
Allis-Chalmers Mfg. Co.
The C. O. Bartlett & Snow Co.
Blaw Knox Co.
Pettibone Mulliken Corp.
Western Precipitation Co.

Dust Conveying Systems
Fuller Company
Western Precipitation Co.

Dust Handling Systems (Hydro Vacuum)
Allen-Sherman Hoff Co.

Dynamite
Atlas Powder Co.

Electric Mine Hoists
Nordberg Mfg. Co.

Electric Power Equipment
Allis-Chalmers Mfg. Co.
General Electric Co.

Elevator Belting (See Belting)

Emery Mills
Sturtevant Mill Co.

Engineers
Arnold & Weigel, Inc.
The Dorr Co.
Fuller Co.
Hetherington & Berner, Inc.
Productive Equipment Corp.
Robins Conveying Belt Co.
F. L. Smidth & Co.
Sturtevant Mill Co.
Traylor Engineering & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Engines (Diesel)
National Supply Co.
Nordberg Mfg. Co.

Excavating Machinery (See Shovels, Cranes, Buckets, etc.)

Excavators (Crawling Tractor)
Koehring Co.

Excavators (Dragline)
Koehring Co.

Explosives
Atlas Powder Co.

Fans
General Electric Co.

Fans (Exhaust)
Sly, W. W., Mfg. Co.

Feeders
Babcock & Wilcox Co. (Pulverized Coal)
Barle C Bacon, Inc.
Besser Mfg. Co.
Fuller Co. (Cement and Pulverized Material)
Hardinge Company, Inc. (Weighing)
Jeffrey Mfg. Co. (Pan & Tube)
Robins Conveying Belt Co.
Ross Screen & Feeder Co.
Smith Engineering Works (Plate)
Stearns Mfg. Co.
Traylor Engineering & Mfg. Co.

Feeders (Weighing)
Schaffer Poidometer Co.

Filters (Air)
Sly, W. W., Mfg. Co.

Filters (Dust)
Sly, W. W., Mfg. Co.

Floor Sweeping Systems (Hydro Vacuum)
Allen-Sherman Hoff Co.

Forges (Oil)
Gardner-Denver Co.

Furnaces
Combustion Engineering Corp.

Fuses
General Electric Co.

Fuses (Detonating and Safety)
Ensign-Bickford Co.

Gaskets
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Gasoline
Socony-Vacuum Oil Co.
Texas Company

Gears (Spur, Helical and Worm)
Jeffrey Mfg. Co.

Gears and Pinions
General Electric Co.
Link-Belt Co.
Pettibone Mulliken Corp.

Gelatin and Semi-Gelatin (See Explosives)

Grapples
Blaw Knox Co.
Hayward Co.
Owen Bucket Co.

Grease
Gulf Refining Co.
Socony-Vacuum Oil Co.
Texas Company

Grinding Balls
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Babcock & Wilcox Co.
Jeffrey Mfg. Co.

Grizzlies
Jeffrey Mfg. Co. (Vibrating)
Pettibone Mulliken Corp.
Robins Conveying Belt Co.
Smith Engineering Works

Grizzly Feeders
Jeffrey Mfg. Co.
Traylor Engr. & Mfg. Co.

Hammer Drills
Cleveland Rock Drill Co.
Gardner-Denver Co.

Hammer Mills (See Crushers)

Hoists
Gardner-Denver Co.
Jackson & Church Iron Wks.
Jaeger Machine Co.
Link-Belt Co.
Northwest Engineering Co.

Hose (Water, Steam, Air Drill, Pneumatic, Sand Suction and Discharge)
Boston Woven Hose & Rubber Co.
B. F. Goodrich Co.
Goodyear Tire & Rubber Co., Inc.

Hose Couplings (See Coupling—Hose, Pipe, etc.)

Hydrators
Blaw-Knox Co.
Jackson & Church Iron Wks.

Insulation (Electric)
General Electric Co.

Kilns (Shaft)
Arnold & Weigel, Inc.
Hardinge Company, Inc

Kilns and Coolers (Rotary
Allis-Chalmers Mfg. Co.
Blaw-Knox Co.
Hardinge Co., Inc.
F. L. Smidth & Co.

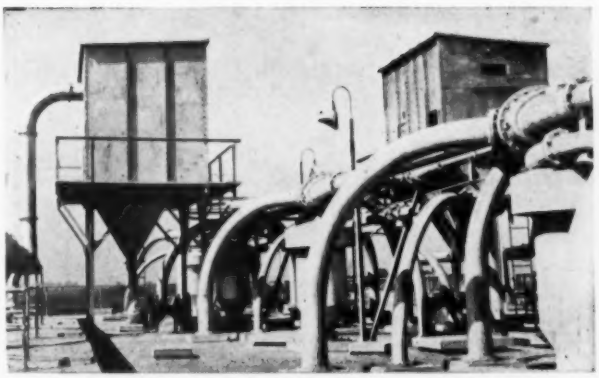
Kominuters (See Mills)

Laboratory Crushers
Birdsboro Steel Foundry & Machine Co.
C. G. Buchanan Co., Inc.
Sturtevant Mill Co.
Williams Patent Crusher Pulv. Co.

Lamp Guards
Flexible Steel Lacing Co.

Lighters, Hot Wire (For Safety Fuse)
Ensign-Bickford Co.

Lime Handling Equipment
Arnold & Weigel, Inc.
Fuller Company
Hardinge Co., Inc.
Link-Belt Co.
Raymond Pulverizer Division



Two Sly Dust Filters on roof of cement silos.

Sly DUST Experience "HOLDS THE KEY" TO THE MOST COMPLETE AND ECONOMICAL SOLUTION OF DUST PROBLEMS.

Dust has no place in efficient plant operation. It is a nuisance. It is a hazard. It represents a considerable loss of your product. Sly Dust Control Systems will do a thorough job of dust suppression, collection and disposal.

THE COST IS LOW. Sly Dust Control Systems are of simple design—and the construction is thoroughly standardized for low first cost, low erection cost and low cost of operation.

The Sly Dust Filter, the heart of a Sly Dust Control System, is of exclusive design. Dust is collected on the OUTSIDE of flat cloth bags and is removed by a simple and most effective motor-shaker. Get our Bulletin S-85 for full particulars.

What are your dust problems?

CLOTH BAG
SLY Dust Filters
FOR DUST CONTROL
SUPPRESSION···POSITIVE COLLECTION···DISPOSAL

THE W.W. SLY MANUFACTURING CO.
4726 Train Ave., Cleveland, Ohio

WAITS FOR NO MAN . . . .

Get your big jobs done on time with Gardner-Denver WDS Wagon Drills—adjustable to any drilling position—12-foot steel changes—Easy to move—more footage per shift—every shift.

GARDNER-DENVER UMB 6-FOOT CHANGE WAGON DRILL

It goes where larger wagon drills can't go—light, mobile—uses any standard Gardner-Denver Drill.

GARDNER-DENVER COMPANY
Quincy, Illinois

Since 1859

GARDNER-DENVER
MORE FOOTAGE PER SHIFT—EVERY SHIFT

Classified Directory—*Continued*

Lime & Hydrating Plants
Arnold & Weigel, Inc.

Lime Kilns (See Kilns and Coolers, Rotary)

Linings (Iron for Ball and Tube Mills) (See Mill Liners)

Linings (Rubber for Chutes, Ball and Tube Mills, Tank and Pipe)
B. F. Goodrich Co.

Loaders and Unloaders
Bucyrus-Erie Co.
Fuller Company
Geo. Haiss Mfg. Co., Inc.
Jeffrey Mfg. Co.
Link-Belt Co.
Northwest Engineering Co.
Robins Conveying Belt

Locomotive Cranes (See Cranes, Crawler and Locomotive)

Locomotives (Diesel Electric)
Davenport-Besler Corp.

Locomotives (Diesel Mechanical)
Davenport-Besler Corp.

Locomotives (Gas-Electric)
Davenport-Besler Corp.
Jeffrey Mfg. Co.

Locomotives (Storage Battery)
General Electric Co.
Jeffrey Mfg. Co.

Locomotives (Steam, Gas and Electric
Davenport-Besler Corp.
General Electric Co.

Log Washer
McLanahan & Stone Corp.
Smith Engineering Works

Lubricants
Gulf Refining
Socony-Vacuum Oil Co.
Texas Company

Lubricants (Wire Rope)
Broderick & Bascom Rope Co (Yellow Strand)

Machinery Guards
Harrington & King Perf. Co.
W. S. Tyler Co.

Magnets
General Electric Co.

Magnetic Pulleys
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.

Manganese Steel Castings
Frog, Switch & Mfg. Co.
Pettibone Mulliken Corp.

Material Handling Equipment
Jeffrey Mfg. Co.

Mechanical Rubber Goods
B. F. Goodrich

Mill Liners and Linings (Iron for Ball and Tube Mills)
Babcock & Wilcox Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Hardinge Company, Inc.
Jeffrey Mfg. Co.
F. L. Smidth & Co.
Traylor Engineering & Mfg. Co.

Mills, Grinding (Ball, Tube, etc.) (See also Crushers, Hammer)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Gruendler Crusher & Pulv. Co.
Hardinge Co., Inc.
Raymond Pulverizer Division
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Mixers (Commercial Concrete)
Jaeger Machine Co.

Mixers (Concrete)
Anchor Concrete Machy. Co.
Besser Mfg. Co.
Gruendler Crusher & Pulv. Co.
Jaeger Machine Co.
Koehring Co.

Mortar Colors
Geo. S. Mepham Corp.
Tamms Silica Co.

Motors and Generators (Electric Units)
Allis-Chalmers Mfg. Co.
General Electric Co.

Motor Trucks
Hug Co.

Nuts (Lock)
Standard Pressed Steel Co.

Oil Burners
Babcock & Wilcox Co.
F. L. Smidth & Co.

Oils (Lubricating)
Gulf Refining Co.
Socony-Vacuum Oil Co.
Texas Company

Packings (Pump, Valve, etc.)
B. F. Goodrich
Goodyear Tire & Rubber Co., Inc.

Paint (Asphalt)
Texas Company

Pallets
Anchor Concrete Machinery Co.
Besser Mfg. Co.
Commercial Shearing and Stamping Co.
Stearns Mfg. Co.

Pavers (Concrete)
Koehring Co.

Perforated Metal
Chicago Perforating Co.
Harrington & King Perf. Co.
Hendrick Mfg. Co.
Joseph T. Ryerson & Son, Inc.

Pipe Machines
Besser Mfg. Co.

Pipe Molds (Concrete)
Besser Mfg. Co.
Stearns Mfg. Co.

Plants (Crushing)
Traylor Engineering & Mfg. Co.

Plants (Sand and Gravel)
Traylor Engineering & Mfg. Co.

Plants (Stone Crushing)
Traylor Engineering & Mfg. Co.

Plates (Double Corrugated)
Hendrick Mfg. Co.

Pneumatic Drills (See Drills)

Poidometers
Schaffer Poidometer Co.

Portable Conveyors
Fuller Company
Geo. Haiss Mfg. Co., Inc.
Link-Belt Co.

Portable Crushing and Screening Unit
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Portable Loaders
Geo. Haiss Mfg. Co., Inc.
Jeffrey Mfg. Co.

Powder (Blasting)
Atlas Powder Co.

Power Tampers
Besser Mfg. Co.

Power Transmission Equipment
Standard Pressed Steel Co.

Precipitators (Electrical)
Western Precipitation Co.

Pulleys, Magnetic (See Magnetic Pulleys)

Pulverators
Allis-Chalmers Mfg. Co.

Pulverizers (See also Crushers, Mills, etc.)
Allis-Chalmers Mfg. Co.
American Pulverizer Co.
Babcock & Wilcox Co.
Dixie Machy. Mfg. Co.

Classified Directory—*Continued*

Gruendler Crusher & Pulv. Co.
Hardinge Co., Inc.
Jeffrey Mfg. Co.
New Holland Machine Co.
Pennsylvania Crusher Co.
Raymond Pulverizer Division
F. L. Smidth & Co.
Sturtevant Mill Co.
Traylor Engineering & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

Pumps (Air Lift)
Fuller Company

Pumps (Cement)
Fuller Company

Pumps (Cement Slurry)
Allen-Sherman Hoff Co.
The Dorr Co.
Morris Machine Works
F. L. Smidth & Co.
A. R. Wilfley & Sons

Pumps (Centrifugal)
Allen-Sherman Hoff Co.
Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Jaeger Machine Co.
Morris Machine Works
A. R. Wilfley & Sons

Pumps (Dredging)
Allen-Sherman Hoff Co.
Bucyrus-Erie Co.
Morris Machine Works

Pumps (Pulverized Coal)
Babcock & Wilcox Co.

Pumps (Sand and Gravel)
Allen-Sherman Hoff Co.
Allis-Chalmers Mfg. Co.
Hetherington & Berner, Inc.
Morris Machine Works
Pettibone Mulliken Corp.
A. R. Wilfley & Sons

Racks or Decks for Lift Trucks
Besser Mfg. Co.

Railways (Electric)
General Electric Co.

Railway Equipment
General Electric Co.

Ready Mixed Concrete Plants
Blaw-Knox Co.
Jaeger Machine Co.

Ready Mixed Concrete (Truck Mixer Bodies)
Blaw-Knox Co.
Jaeger Machine Co.

Reciprocator Feeder for Unloading Hopper Bottom Cars
Besser Mfg. Co.

Recovery Plants (Dust)
Sly, W. W., Mfg. Co.

Road Machinery
Blaw-Knox Co.
Harnischfeger Co.
Koehring Co.
Northwest Engineering Co.

Rock Bits (See Drill Bits)

Rod Mills
Hardinge Co., Inc.
Jackson & Church Iron Wks.

Roller Bearings
Timken Roller Bearing Co.

Roofing (Ready to Lay)
Texas Company

Rope, Wire (See Wire Rope)

Rotary Screens (Sections and Segments)
Hendrick Mfg. Co.

Rubber Covered Screens
B. F. Goodrich Co.

Rubber Moulded Goods
Boston Woven Hose & Rubber Co.

Sack Balers
Besser Mfg. Co.

Sandblast Equipt.
Sly, W. W., Mfg. Co.

Sand Drag
Smith Engineering Works

Sand Settling Tanks
Jeffrey Mfg. Co.
Link-Belt Co.
Nordberg Manufacturing Co.
Smith Engineering Works

Scrapers (Power Drag)
Blaw-Knox Co.
Link-Belt Co.
Northwest Engineering Co.
Sauerman Bros., Inc.

Screens
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.
The C. O. Bartlett & Snow Co.
Besser Mfg. Co.
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Chicago Perforating Co.
Cleveland Wire Cloth & Mfg. Co.
Hardinge Co., Inc.
Harrington & King Perf. Co.
Hendrick Mfg. Co.
Industrial Brownhoist Corp.
Jeffrey Mfg. Co.
Link-Belt Co.
Ludlow-Saylor Wire Co.
New Holland Machine Co.
Nordberg Mfg. Co.
Productive Equipment Corp.
Robins Conveying Belt Co.
Ross Screen & Feeder Co.
Simplicity Engineering Co.
Smith Engineering Works
Sturtevant Mill Co.
Universal Vibrating Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens (Revolving)
Geo. Haiss Mfg. Co., Inc.

Screens, Scalping (Hercules and Standard)
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Screens (Perforated
Hendrick Mfg. Co.

Screens (Testing)
Hendrick Mfg. Co.

Screens (Vibrating)
Deister Machine Co
Jeffrey Mfg. Co.
Link-Belt Co.
Nordberg Mfg. Co
Robins Conveying Belt Co.
Simplicity Engineering Co.
Smith Engineering Works
Sturtevant Mill Co.
W. S. Tyler Co.
Universal Vibrating Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens, Washing (Hercules, Ajax and Standard)
Smith Engineering Works

Screw Conveyors
Besser Mfg. Co.

Screw Rewasher (Single and Twin)
Smith Engineering Works

Screws (Cap, Self Locking, Set, Hollow Set)
Standard Pressed Steel Co.

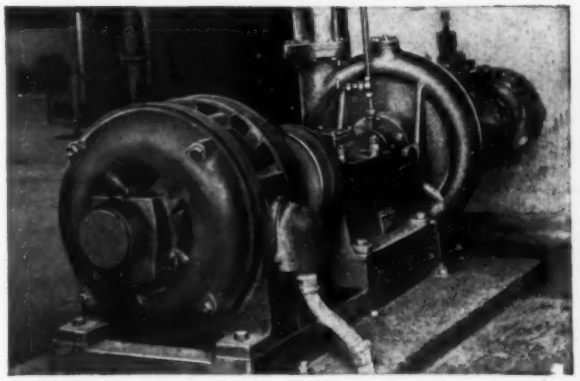
Scrubbers, Washers
Allis-Chalmers Mfg. Co.
Earle C. Bacon, Inc.
Hardinge Company, Inc.
Lewistown Fdy. & Mach. Co.
Smith Engineering Works
Traylor Engineering & Mfg. Co.

Separators (Magnetic)
Birdsboro Steel Foundry & Mach. Co.
C. G. Buchanan Co., Inc.

Separators (Slurry)
F. L. Smidth & Co.

The MORRIS HYDRAULIC COLUMN

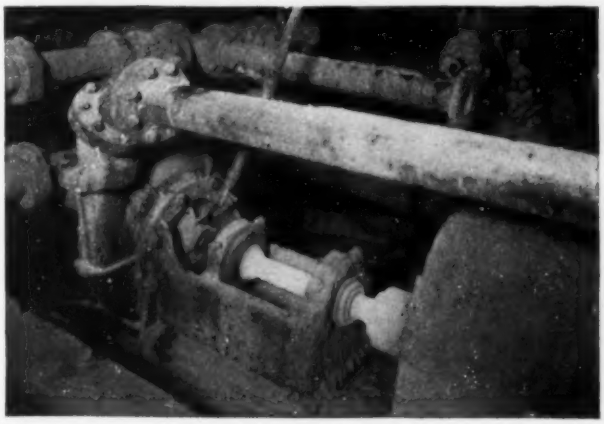
News of interest to Centrifugal Pump Users



Scrap a perfectly good pump? Yes! —In many cases . . . .

There are many centrifugal pumps which are operating in a perfectly satisfactory manner but should nevertheless be scrapped. Why? Because the unnecessary power they are using would quickly pay for a new pump. Within the last few years centrifugal pump efficiencies have been increased 10 percent and more. Figure for yourself the yearly saving you would secure from a 10 percent reduction in your pumping costs. Capitalized at 6 per cent, the saving would most likely quickly pay for new pumping equipment. The Morris Engineers are prepared to work out the problem exactly for you if you will merely write Morris your operating conditions. There is no obligation and you will get an authoritative answer.

▼ ▼ ▼



Pumping slurry without worry . .

Hot, acid, highly abrasive slurry can be successfully handled only by pumps with extreme stamina. Morris Slurry Pumps have this necessary stamina. Their massive design gives long service with corrosive and abrasive mixtures, their parts subject to wear are made of specially refractory materials, their liquid passages will handle thick slurries without choking or slippage, and their efficiencies compare favorably with those of clear water pumps. These trouble-free units are described in Morris Bulletin 156 which will be sent on request.

For authoritative recommendation on any pumping or dredging problem, write to Morris Machine Works, Baldwinsville, N. Y. Representatives in Principal Cities

Classified Directory — *Continued*

Shovels, Power (Steam, Gas, Electric, Diesel, Oil)
Bucyrus-Erie Co.
Harnischfeger Corp.
Industrial Brownhoist Corp.
Koehring Co.
Lima Locomotive Works, Inc. (Ohio Power Shovel Co.)
Link-Belt Co.
Michigan Power Shovel Co.
Northwest Engineering Co. (Crawling Tractor)
Thew Shovel Co. (Crawling Tractor)

Silos
Chicago Bridge & Iron Co.
F. L. Smidth & Co.

Skip Hoists and Skips
Link-Belt Co.

Slings (Wire Rope)
American Cable Co., Inc.
A. Leschen & Sons Rope Co.

Special Aggregates
Tamms Silica Co.

Speed Reducers
Link-Belt Co.

Standpipes
Ross Screen & Feeder Co.

Steel, Abrasion Resisting
Joseph T. Ryerson & Son, Inc.

Steel Bars
Timken Roller Bearing Co.

Steel (Electric Furnace)
Chicago Steel Foundry Co.
Timken Roller Bearing Co.

Steel (Open Hearth)
Timken Roller Bearing Co.

Steel (Special Alloy)
Timken Roller Bearing Co.

Steel (Special Analysis)
Timken Roller Bearing Co.

Steels, Drill (See Drill Steel)

Stokers
Babcock & Wilcox Co.
Combustion Engineering Corp.

Strippers
Besser Mfg. Co.

Stucco Materials
Geo. S. Mepham Corp.

Tanks
Combustion Engineering Corp.
The Dorr Co.
Hendrick Mfg. Co.
Jeffrey Mfg. Co.
Link-Belt Co.

Thickeners
The Dorr Co.
Hardinge Co., Inc.

Tile Machines (Drain)
Besser Mfg. Co.

Tires and Tubes
B. F. Goodrich Co.

Track Equipment
Carnegie-Illinois Steel Corp. (United States Steel Corp. Subsidiary)
Nordberg Mfg. Co.

Track Shifters
Nordberg Mfg. Co.

Tractors
Koehring Co.

Trailers (3-Way Dump)
Athey Truss Wheel Co.

Tramways (Aerial Wire Rope)
Broderick & Bascom Rope Co. (Yellow Strand)
A. Leschen & Sons Rope Co.

Transmission Belting (See Belting)

Transmission Machinery
Allis-Chalmers Mfg. Co.
Timken Roller Bearing Co.

Truck Bodies (Ready Mixed Concrete)
Blaw-Knox Co.
Jaeger Machine Co.

Trucks (Mixers)
Blaw-Knox Co.
Jaeger Machine Co.

Trucks and Trailers (See Motor Trucks)

Tube Mills (See Mills, Ball, Tube, etc.)

Tube Mill Liners (See Mill Liners)

Tubing (Blasting)
B. F. Goodrich Co.

Tubing (Seamless Steel)
Timken Roller Bearing Co.

Underground Loaders
Thew Shovel Co.

Underground Shovels
Nordberg Mfg. Co.

Valves (Air)
Cleveland Rock Drill Co.

Valves (Pump)
B. F. Goodrich Co.

Vibrating Screens (See Screens, Vibrating)

Vibrators
W. S. Tyler Co.

Wagons & Trailers (Dump)
Athey Truss Wheel Co.

Washers (Sand, Gravel and Stone)
Allis-Chalmers Mfg. Co.
The Dorr Co.
Eagle Iron Works
Gruendler Crusher & Pulv. Co.
Hardinge Copmany, Inc.
Jeffrey Mfg. Co.
Link-Belt Co.
Traylor Engr. & Mfg. Co.

Waste Heat Boilers
Combustion Engineering Corp.

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Tamms Silica Co.

Water Softening Systems
Deister Machine Co

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Schaffer Poidometer Co.

Weigh-Mix
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Welding and Cutting Apparatus
General Electric Co.

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Wire Rope Sockets (See Sockets, Wire Rope)

Wrenches (Car)
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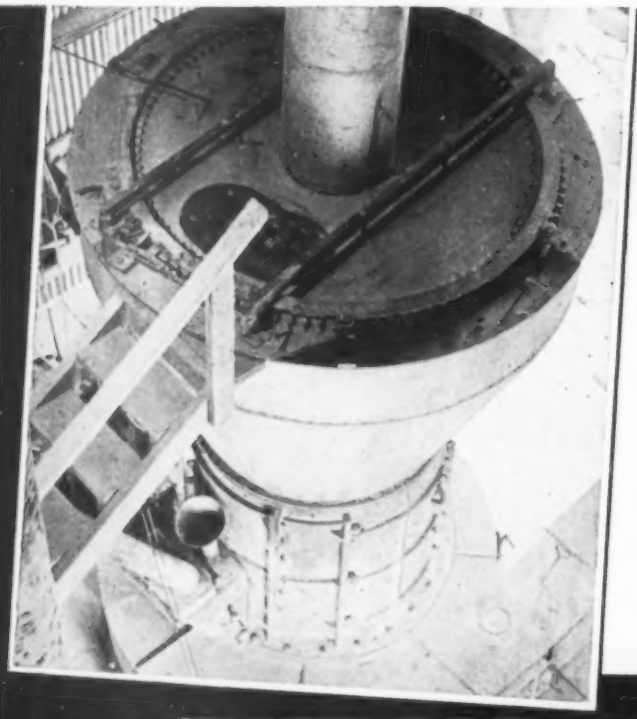

Fine Grinding **Costs Less** with Williams ROLLER MILLS

- More efficient Separator
  Instantly changeable from 70%—100 Mesh to 99.9%—325 Mesh
- Ball Bearing Operation
  Smooth running—Trouble free
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ROLLER MILLS
SHREDDERS
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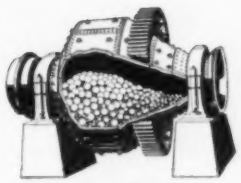
Grinding

WET DRY



HARDINGE CONICAL MILL

THE CONICAL MILL is ideal, when operated in open circuit, where a granular product of ten to twenty mesh is desired.

For a finer product, ground wet, the Mill should be operated in closed circuit with a Hardinge Counter Current Classifier. This combination produces a uniformly fine product, whether 28 or as fine as 325 mesh, and no material leaves the circuit until it is properly ground.

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Sand is washed mechanically by the revolving buckets and discharged after draining without loss of head. The bulk of the fine grain is recovered and not lost in the silt-laden overflow water.

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FURNISHED IN THREE CONVENIENT SIZES

SIZE	CAPACITY
7 ft. dia.	20-40 tons per hr.
9 ft. dia.	40-80 tons per hr.
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"TOPS" in Efficiency

4′ x 8′ Double Deck
Model "B" Screen

They will grade larger tonnages with higher efficiencies than can be secured by using any other screen of comparable size. This superiority is the result of combining a solid counterbalanced shaft, resilient rubber mountings, screen cloth in four way tension over a doubly crowned deck surface, completely protected bearings together with the many other SIMPLICITY features.

SIMPLICITY GYRATING SCREENS are built in Single, Double or Triple Decks in 12 sizes ranging from 2′ x 3′ to 5′ x 20′.

Our engineers will gladly study your particular screening problem and make a definite recommendation for its most practical solution.

SIMPLICITY ENGINEERING CO. DURAND MICHIGAN

THE MICHIGAN GIVES YOU MORE IN ONE

SAVES TIME and MONEY from FIRST to LAST

That's MICHIGAN Shovel's record on construction jobs where contractors make most of its utility. The Shovel pictured here, for instance, has already cleared the land, removed old masonry, and is now shown trenching for concrete footings. Then it will unload materials, excavate basement, erect steel, grade fills, and do a score of other tasks which will pay its way, and more. In addition, the MICHIGAN is always ready to "step out" to another location at truck speed. Get more in one with a MICHIGAN! Convertible to Shovel, Clam, Dragline or Trench Hoe. . .

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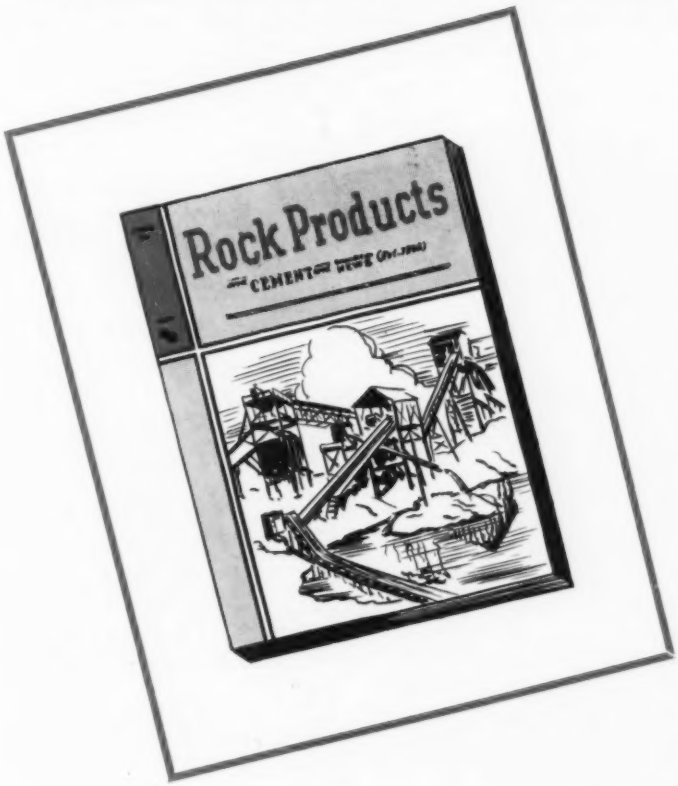
- Air Controls
- Rugged Frame
- Ample Power
- Roomy Cab
- 25 mph. Speed
- TruckEconomy

MICHIGAN POWER SHOVEL Co BENTON HARBOR, MICHIGAN, U.S.A.

You can't afford to miss the NOVEMBER ISSUE! *of*

ROCK PRODUCTS



Special and Unusual Features of the November Issue

The November issue will stress safety. It will contain a complete report of the proceedings of the National Safety Congress. Keen advertisers will use this opportunity to stress labor-saving, as well as accident-saving, modern equipment.

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In addition to several special feature articles each month ROCK PRODUCTS carries a number of departments which are invaluable to every department and branch of the industry; CHEMISTS' CORNER, chemical tests and experiments; HINTS AND HELPS for plant superintendents; FINANCIAL NEWS AND COMMENT; LIME PRODUCERS' FORUM, for the lime industry; NEW MACHINERY AND EQUIPMENT; NEWS OF THE INDUSTRY! TRAFFIC AND TRANSPORTATION; CONCRETE AND CEMENT PRODUCTS, a separate division for producers of concrete products; and DIGEST OF FOREIGN LITERATURE.

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ROCK PRODUCTS is the prime authority of the entire rock products industry. All the important relevant information on the industry is written and edited each month so that it is interesting, easily understood and applicable to the operators' problems. Consequently ROCK PRODUCTS is read from cover to cover.

Your subscription to ROCK PRODUCTS is the best investment you can make in your business or your job.

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Mail the coupon today so you will be sure of receiving this important November issue and eleven more filled with all the most interesting and helpful information about your business. We will also send you without cost a copy of our BIG BOOK—HINTS AND HELPS FOR SUPERINTENDENTS. This profusely illustrated 96-page, 8½"x11", book contains the most valuable ideas selected from the thousands submitted and are based on successful experience. This book alone is well worth more than the low subscription price. $2.00 for one year, or the more economical price of $3.00 for two years. ***(Foreign postage $2.00 extra per year.)***

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American Crushers produce a more uniform product . . . minimum fines with no slivers or chips.

Write for complete details.

Front view showing breaker plate adjustment.

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NO. 9443 TY-ROD for HIGH-CAPACITY SCREENING NO. 9424 TY-ROD

Ty-Rod Avoids Blinding!

for DAMP, STICKY, FIBROUS and SLOW-SCREENING MATERIALS

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CLEVELAND, OHIO
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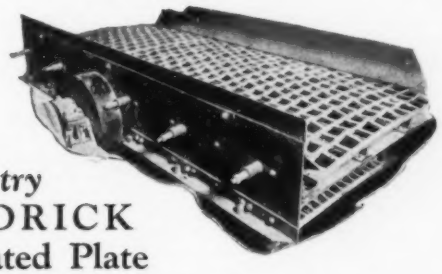
NO. 9381 TY-ROD

If It's A Vibrating Screen . . . . .



you should try
HENDRICK
Perforated Plate

The vibrating screen is a tough service . . . . where perforated plate provides the most productive results.

In supplying your perforated plate, Hendrick with facilities for producing any shape of opening, can recommend the most efficient screening medium for a specific job.

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This time, put Hendrick Perforated Plate on your vibrating screens.

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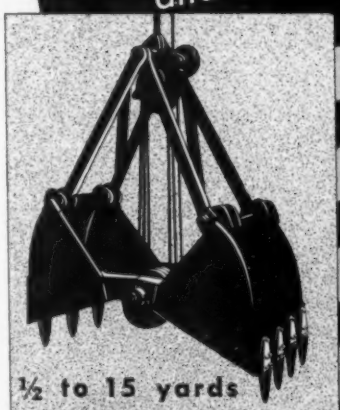
SALES OFFICES IN PRINCIPAL CITIES
PLEASE CONSULT TELEPHONE DIRECTORY
Makers of Elevator Buckets of all types, Mitco Open Steel Flooring, Mitco Shur-Site Treads and Mitco Armorgrids. Light and Heavy Steel Plate Construction.

BUCKETS
for every kind of rehandling and excavating service



½ to 15 yards capacity

ROPE-REEVE
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LEVER-ARM
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GENERAL OFFICES: BAY CITY, MICHIGAN
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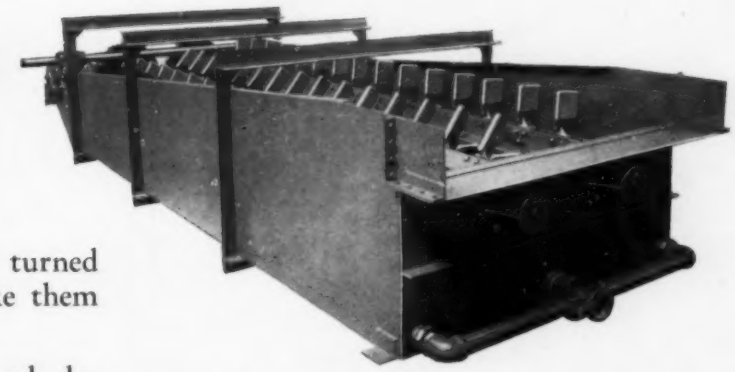
LESS Upkeep MORE Profit



and the finer finished products turned out by EAGLE WASHERS make them the logical first choice.

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EAGLE PADDLE LOG and SCREW WASHERS thoroughly wash and scrub material and eliminate sticks, leaves, silt, coal, shale and clay balls.

With an EAGLE WASHER you can turn deposits formerly considered unprofitable into real money makers.

Write us today for complete details.

EAGLE IRON WORKS
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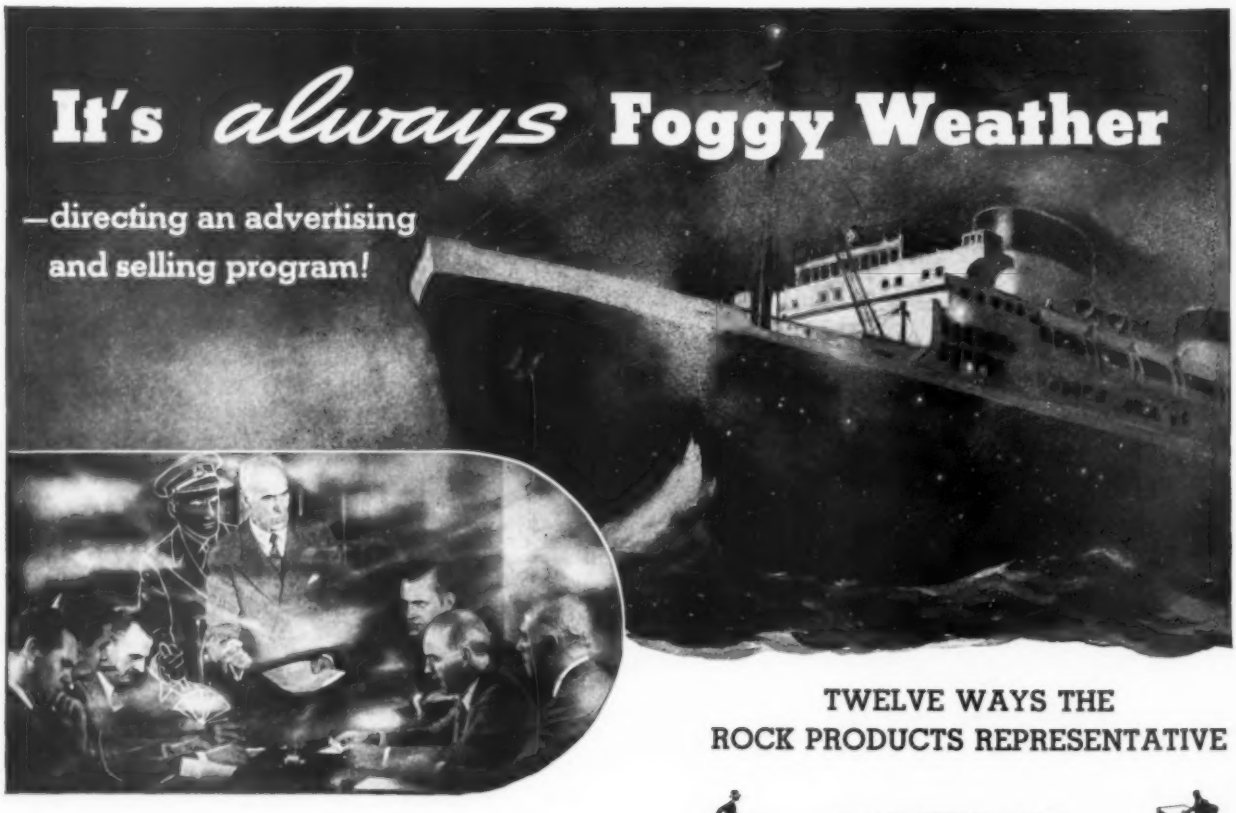

Just as in navigating a stormy sea, all available guides to skill should be employed. But although reliable business papers possess a special knowledge of the markets they serve, many advertisers overlook this trustworthy source of guidance.

By "reliable" we mean the A.B.P. sort of publications that employ highly trained editors whose sole obligation is to glean and interpret important events, to advance practical ideas, to render tangible help to readers who *want it enough to pay for it* . . . the kind that devote themselves so diligently to the subscribers' interests that they can truthfully offer advertisers "packaged influence" reaching a "conditioned" audience.

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6. To aid in improving sales and distributive setup.
7. To help you see your business as business sees it.
8. To scan copy for trade jargon.
9. To suggest new products, or new markets for old products.
10. To suggest ways to make sales promotion more effective.
11. To help devise practical merchandising material.
12. To point out specific sales opportunities.

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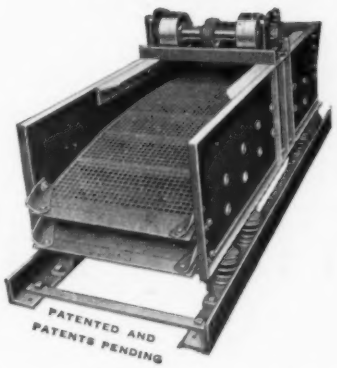
PLAT-O



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VIBRATING SCREEN

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Write for Descriptive Bulletin No. 22

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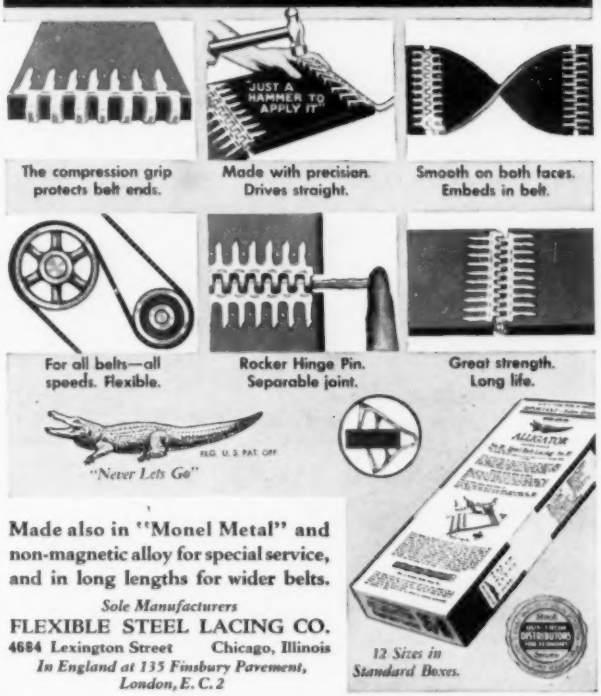
1933 EAST WAYNE STREET FT. WAYNE, IND.

ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING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Made with precision. Drives straight.
Smooth on both faces. Embeds in belt.
For all belts—all speeds. Flexible.
Rocker Hinge Pin. Separable joint.
Great strength. Long life.
"Never Lets Go"
REG. U. S. PAT. OFF.

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12 Sizes in Standard Boxes.

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COAL FEEDERS

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SHAKING GRATES FEED ROLLS
PNEUMATIC DRAW-SHEARS

LIME TESTING ANALYSES
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Incorporated
CONTRACTORS and ENGINEERS
Located at
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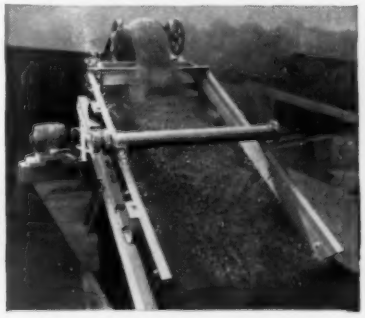
For Accurate Screening and Sizing



● All materials, fine or coarse, light or heavy... clay, gravel, sand, ores, crushed stone, coal, coke, fertilizer, grain, sugar, chemicals, pulpwood chips, etc....yield to the wizardry of the mechanically-vibrated Link-Belt Vibrating Screen, and classify themselves in strict accordance with their size. Its uniform vibration keeps the meshes open, and makes the screen's entire screening surface 100% effective. Send for Book No. 1562.

Address Link-Belt Company, Philadelphia, Chicago, Indianapolis, Atlanta, San Francisco, Toronto, or any of our offices located in principal cities. S905

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GOOD USED EQUIPMENT

5—Ruggles Coles Class "A" Direct Heat Rotary Dryers: 5x26', 5x30', 80"x40', 70"x45', 8'8"x85'.
12—Direct Heat Rotary Dryers: 3x30', 4x30', 5x30', 5x60', 6x40', 6x50', 6x60', 8x60'.
7—Rotary Kilns: 5x30', 6x60', 7x100', 8x110', 8x125', 9'6"x150'.

3—24" No. 4 Mikro Pulverizers, each triple screw feed and stirrup hammers for fine pulverizing of clays, etc.

1—24"x36" Bacon-Farrel Jaw Crusher.
1—24"x36" Allis Chalmers Jaw Crusher.
8—Jaw Crushers: 4x10", 10x7" Farrel; 6x24", 7x24" Sturtevant reduction; 9x15" Champion—other sizes & types.

1—4x8' Allis Chalmers Vib. Screen, 2-deck.
3—3x6' Niagara Screens, 2-deck.
1—24" Stone Elevator, chain, 70' c/c.
8—Tyler Hummer Screens—3x5', 4x5', 4x7', Types 31, 33, 37, 39, 60.
2—Tyler V-32 Vibrators, Mag. units only.
4—Single Roll Crushers: 18x16" Penna., 18x18" Jeffrey, 18x24" McLanahan, 24x24" Link Belt.
10—Crushing Rolls: 20x14" Sturtevant; 24x14", 36x16" "B" Allis Chalmers; and larger.

2—10' Sturtevant Air Separators.
1—5 Roll Raymond High Side Mill.
3—4 and 5 roll Raymond Low Side Mills.
5—Raymond Pulverizers: Nos. 0000, 00, 1, 3.
7—Raymond Imp Mills: Nos. 3, 32, 45, 50, 55.
7—Hardinge iron lined Ball Mills: 3'x8", 4½'x16", 6'x16", 6'x22", 8'x22", 8'x30".
1—No. 32 Marcy Ball Mill.
1—3'x12' Hendy Iron lined Tube Mill.
1—5'x22' Bonnot iron lined Tube Mill.

Just a partial list
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What do you wish to sell? Send us details.

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Plant and Shops at Newark, N. J., cover 8 acres of ground.

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Electric Motor and Machy. Bargains
For Reliability and Economy

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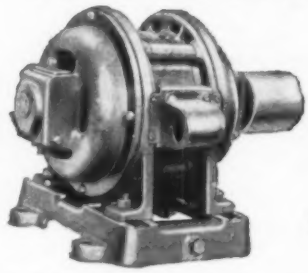

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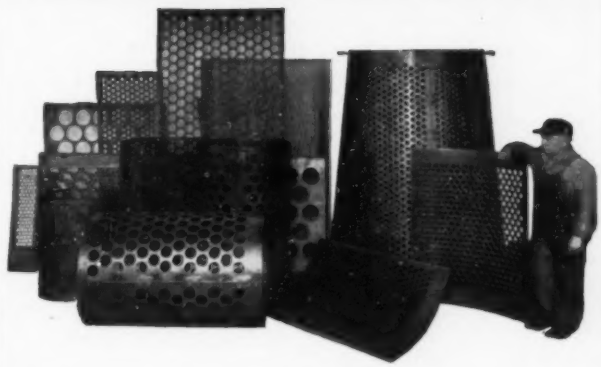

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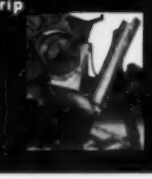

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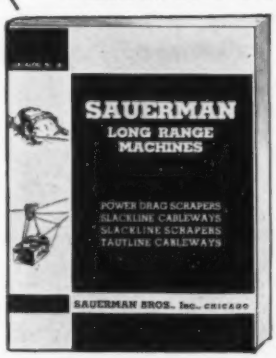

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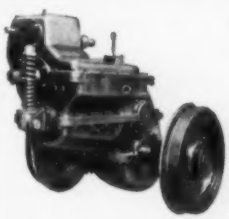

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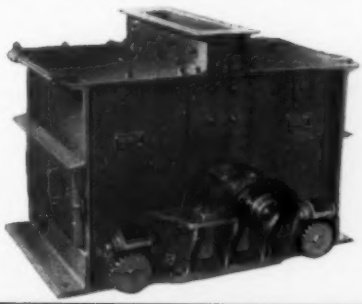

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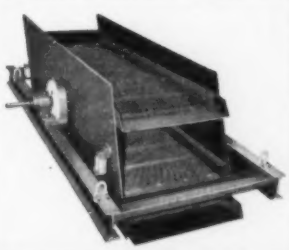

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4—Round Shaft Buckets.
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50—Column Clamps.

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Sullivan 110.
Chrysler 136.
Ing.-Rand Jackhammers and Busters.
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10-S Concrete Mixer.
27-E Ransome Paver.
5-ton Bflo.-Spring, 3 wheel roller.
Lakewood finisher.
Insley Shoulder Machine.
2—5-yd. Athey Crawler Wagons.
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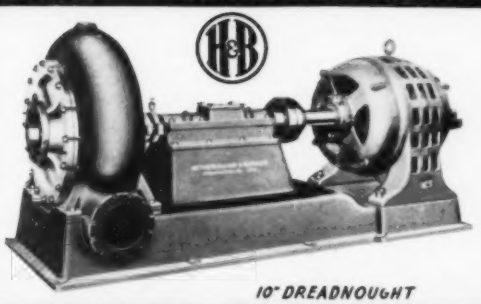

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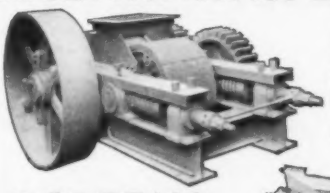

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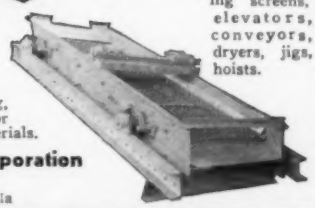

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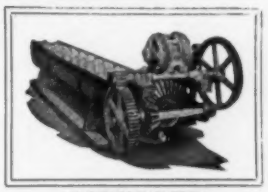

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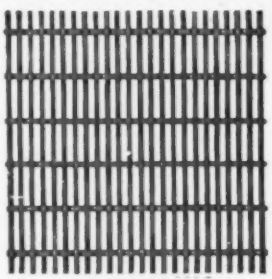

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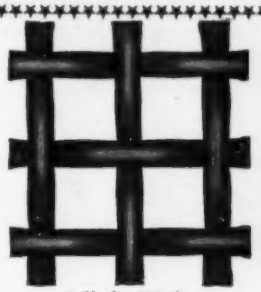

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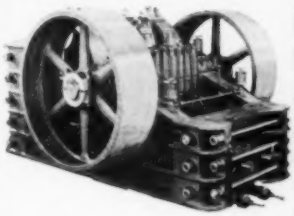

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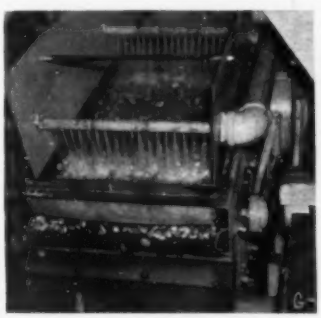

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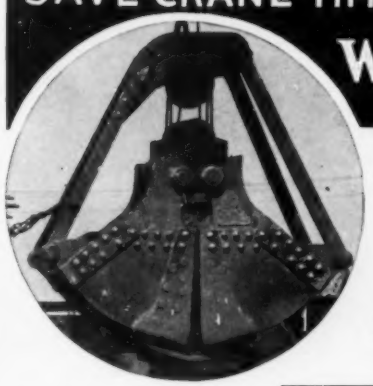

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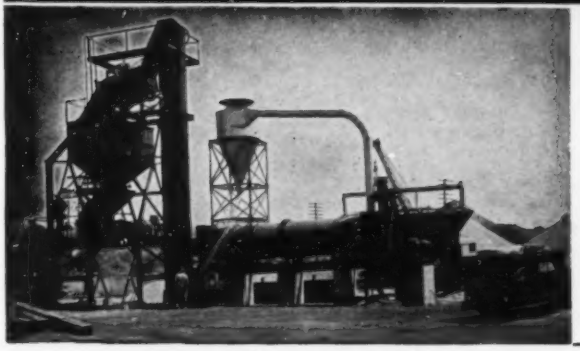

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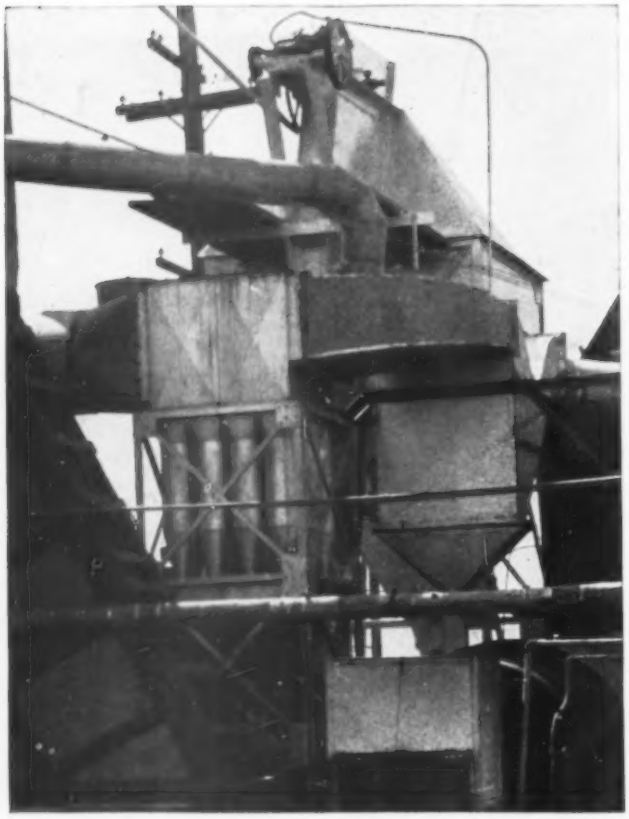

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Small tube construction used in Multiclones results in low turbulance, positive dust conduction and maximum centrifugal force to throw the suspended material out of the gas stream. Large volumes of gas can be handled by grouping unit tubes in parallel to any desired capacity. Multiclones are all metal, able to handle hot or cold gases without fire hazard and occupy small floor space and headroom. No water or filter cloths are used. All parts are readily accessible for cleaning or sterilization. Low draft loss conserves power and reduces operating costs.

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PIONEER IN DUST AND FUME CONTROL

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EXPLOSIVES

CHEMICALS ATLAS EXPLOSIVES

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A typical example of Goodrich development in rubber

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Goodrich worked with the manufacturer, and developed a ball made of *hard sponge rubber* and a semi-hard rubber mallet head, both more uniform and true than was ever possible in the old wood balls and mallets. Together they speed up the game and make it more scientific—and today croquet is staging a prosperous comeback.

Here is another of the hundreds of developments made possible by Goodrich research in rubber. This research, which has been going on constantly for years, has resulted in scores of new and different kinds of rubber—hard rubber as well as soft—

—one so resistant to abrasion that in many uses it outlasts steel 10 to 1

—another which is resistant to acids

—another which will flex almost indefinitely without appreciable stretch or wear

—others which can be made in any shape or color, and made to simulate human skin, snake skin, hair, cloth or almost anything else.

Rubber, as Goodrich can make it, is a *new material* with thousands of new uses. It can add life and sales appeals to new products, just as it is adding life and reducing operating costs in standard products such as belting and hose. The B. F. Goodrich Company, Mechanical Rubber Goods Division, Akron, Ohio.

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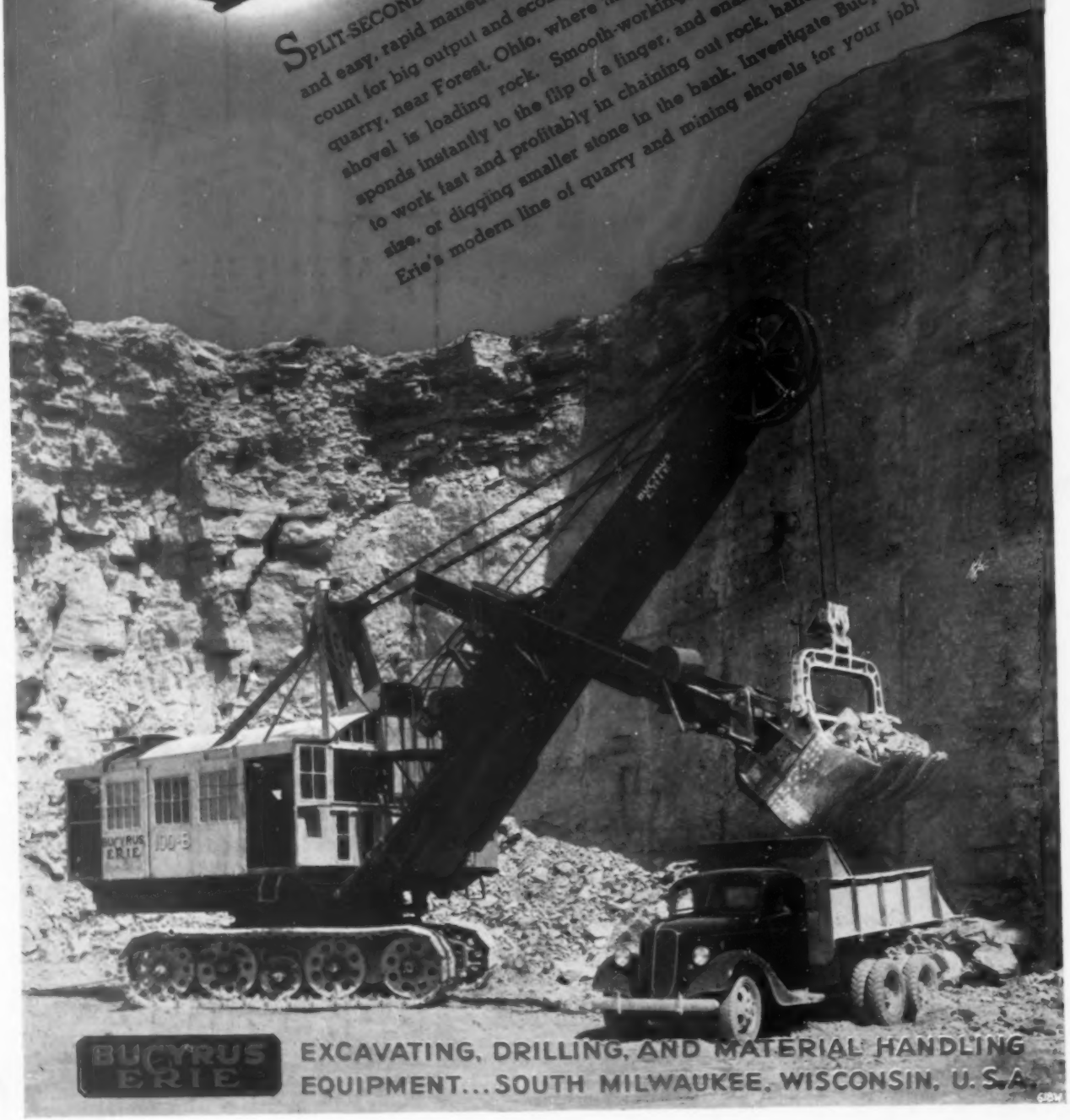

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